Technical Specifications

InRow™ Direct Expansion Air Conditioners

Air-Cooled/Fluid-Cooled
Up to 37 kW

Schneider Electric

American Power Conversion Legal Disclaimer

The information presented in this manual is not warranted by the American Power Conversion Corporation to be authoritative, error free, or complete. This publication is not meant to be a substitute for a detailed operational and site specific development plan. Therefore, American Power Conversion Corporation assumes no liability for damages, violations of codes, improper installation, system failures, or any other problems that could arise based on the use of this Publication.

The information contained in this Publication is provided as is and has been prepared solely for the purpose of evaluating data center design and construction. This Publication has been compiled in good faith by American Power Conversion Corporation. However, no representation is made or warranty given, either express or implied, as to the completeness or accuracy of the information this Publication contains.

IN NO EVENT SHALL AMERICAN POWER CONVERSION CORPORATION, OR ANY PARENT, AFFILIATE OR SUBSIDIARY COMPANY OF AMERICAN POWER CONVERSION CORPORATION OR THEIR RESPECTIVE OFFICERS, DIRECTORS, OR EMPLOYEES BE LIABLE FOR ANY DIRECT, INDIRECT, CONSEQUENTIAL, PUNITIVE, SPECIAL, OR INCIDENTAL DAMAGES (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF BUSINESS, CONTRACT, REVENUE, DATA, INFORMATION, OR BUSINESS INTERRUPTION) RESULTING FROM, ARISING OUT, OR IN CONNECTION WITH THE USE OF, OR INABILITY TO USE THIS PUBLICATION OR THE CONTENT, EVEN IF AMERICAN POWER CONVERSION CORPORATION HAS BEEN EXPRESSLY ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. AMERICAN POWER CONVERSION CORPORATION RESERVES THE RIGHT TO MAKE CHANGES OR UPDATES WITH RESPECT TO OR IN THE CONTENT OF THE PUBLICATION OR THE FORMAT THEREOF AT ANY TIME WITHOUT NOTICE.

Copyright, intellectual, and all other proprietary rights in the content (including but not limited to software, audio, video, text, and photographs) rests with American Power Conversion Corporation or its licensors. All rights in the content not expressly granted herein are reserved. No rights of any kind are licensed or assigned or shall otherwise pass to persons accessing this information.

This Publication shall not be for resale in whole or in part.

Table of Contents

Technical Data 1

Model Identification 1

Model identification label location 1

Model Descriptions 1

Standard Features and Options 2

Capacities 2

Room Air Distribution 2

Standard Features 3

All series: 3

ACRD100 series and ACRD200 series only: 3

ACRD500/ACRP100 series only: 3

Accessories 4

Scalable Solution for Critical Environments 5

InRow Advantages 5

Scalable for High Density 5

Cabinet 6

Shutdown input/alarm output 6

Variable speed fans 6

Bay Kit-InRow DX/NetShelter SX 6

Counterflow Cooling Coil/Condensate Pan 6

Filters 6

Selectable top or bottom piping connections 6

Network Management Card 6

Condensate pump 7

Remote temperature sensors 7

Electric reheat (ACRP100 series only) 7

Pipe adapters (ACRD500 and ACRP100 series only) 7

Humidifier (ACRP100 series only) 7

Optional Features 8

Cable water detector 8

Network cable 8

Filters 8

Power Trough 8

Data Partition 8

Height Adapters 8

Hot Aisle Containment System 9

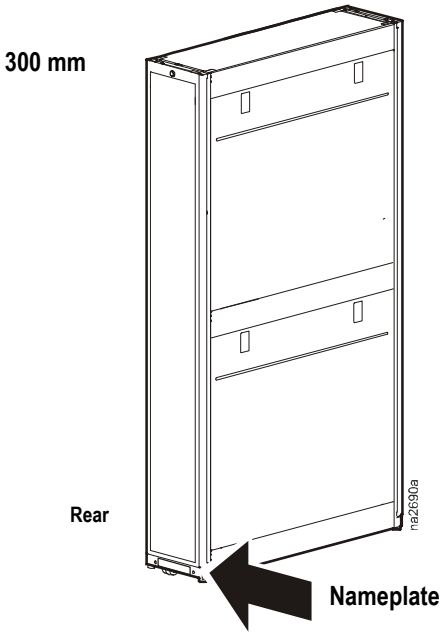
Microprocessor Controller 10
Microprocessor controller 10
Open Architecture 10
Control Type 10
Functions 10
Logging 10
Control 11
Alarms 11
InRow DX Models. 13
Exterior components: ACRD100 and ACRD200 series 13
Interior components (front): ACRD100 series 14
Interior components (rear): ACRD100 series 15
Interior components (front): ACRD200 series 16
Interior components (rear): ACRD200 series 17
Exterior components: ACRD500/ACRP100 series 18
Interior components (front): ACRD500/ACRP100 series 19
Air-cooled interior components—ACRD500/ACRP100 series (back of unit) 20
Electrical panel: ACRD100 and ACRD200 series 21
Electrical panel:ACRD500/ACRP100 series 22
User interface panel: ACRD500/ACRP100 series 23
Performance Specifications 24
Net cooling capacity (air and glycol cooled) 24
Performance at Percentage of Fan Speed. 26
ACRD100 series 26
ACRD200 series 28
ACRD500/ACRP100 series (No humidifier/no reheat) 29
General Data 30
General Specifications – ACRD200 series 30
Fluid-cooled unit performance 30
Air-Cooled unit performance 31
Altitude correction factors 32
Sound performance data 33
Electrical Data 34
Dimensional Data. 35
ACRD100/ACRD200 series 35
ACRD500/ACRP100 series 36
NetShelter SX to VX Height Adapter: ACRD100/ACRD200 series 37
NetShelter SX to VX Height Adapter: ACRD500/ACRP100 series 37
NetShelter SX to 48-U SX Height Adapter: ACRD100/ACRD200 series 37
NetShelter SX to 48-U SX Height Adapter: ACRD500/ACRP100 series 37
Piping and Mechanical Connections 38
Refrigeration piping diagram (ACRD100/ACRD500/ACRP100 series)) 38
Water-cooled piping–bottom piping (ACRD200 series) 39
Glycol-cooled bottom piping (ACRD200 series) 40
Top piping and power access locations (ACRD100/ACRD200 series) 41
Bottom piping and power access locations–looking up (ACRD100/ACRD200

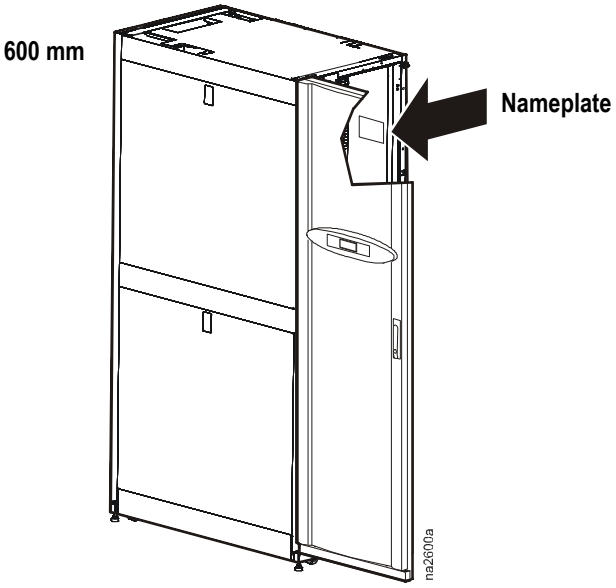
series) 42
Air-cooled piping access–top view, looking down (ACRD500/ACRP100 series) . . 43
Air-cooled piping access – bottom view, looking up (ACRD500/ACRP100 series) 44
Outdoor Heat Exchangers 45
Air-cooled condensers – mechanical Data (ACRD100 series) 45
Air-cooled condensers mechanical data (ACRD500/ACRP100 series) 45
Fluid coolers – mechanical data (ACRD200 Series) 45
Air-cooled condensers – electrical data (ACRD100 series) 46
Air-cooled condensers - electrical data (ACRD500/ACRP100 series) 46
Fluid coolers - electrical data (ACRD200 series) 46
ACCD75201 and ACCD75204 47
ACCD75202 and ACCD75205 47
ACCD75203 and ACCD75206 47
ACCD75207 48
ACCD75208 and ACCD75209 48
ACCD75214 49
ACCD75215 49
ACCD75216, ACCD75218, and ACCD75220 49
ACCD75217 and ACCD75219 49
ACFC75210 50
ACFC75255 50
ACFC75256 50
ACFC75257 51
Facility Planning 53
Warranty 55
Guide Specifications 58
Guide Specifications for InRow Direct Expansion 58

Technical Data

Model Identification

Model identification label location





Model Descriptions

Model	Width	Range of Capacity	Heat Rejection	Humidifier/ Reheat	Power
ACRD100	300 mm	Up to 10 kW	Air-cooled	No	208–230 1-Phase 60 Hz
ACRD101	300 mm	Up to 10 kW	Air-cooled	No	220–240 1-Phase 50 Hz
ACRD200	300 mm	Up to 10 kW	Fluid-cooled	No	208–230 1-Phase 60 Hz
ACRD201	300 mm	Up to 10 kW	Fluid-cooled	No	220–240 1-Phase 50 Hz
ACRD500	600 mm	Up to 37 kW	Air-cooled	No	200–240 3-Phase 50/60 Hz
ACRD501	600 mm	Up to 37 kW	Air-cooled	No	460–480 3-Phase 60 Hz
ACRD502	600 mm	Up to 37 kW	Air-cooled	No	380–415 3-Phase 50/60 Hz
ACRP100	600 mm	Up to 37 kW	Air-cooled	Yes	200–240V 3-Phase 50/60 Hz
ACRP101	600 mm	Up to 37 kW	Air-cooled	Yes	460–480V 3-Phase 60 Hz
ACRP102	600 mm	Up to 37 kW	Air-cooled	Yes	380–415V3-Phase 50/60 Hz

Standard Features and Options

The modular, row-based computer room cooling system offers efficient, predictable, and economical cooling for a variety of spaces.

Critical environmental requirements now reach far beyond the confines of the traditional data center or computer room to encompass a larger suite of applications, referred to as technology rooms. Critical environment applications include:

- Computer rooms
- Telecommunication facilities
- Clean rooms
- Power equipment
- Medical equipment rooms
- LAN/WAN environments

A worldwide network of APC by Schneider Electric representatives is fully qualified to provide engineering, sales, installation, and service for our products.

Capacities

InRow Direct Expansion (DX) units are available in two sizes (300mm and 600mm) with nominal capacities ranging from 2-10 kW (300mm) and 10-37 kW (600mm).

Room Air Distribution

Row-based systems are placed in line with rack enclosures. At least one system is used per hot aisle. Air is drawn in through the rear of the system, cooled, and discharged into the cold aisle, thereby neutralizing the sensible heating effects of the data processing equipment. InRow™ DX products deliver high volumes of airflow to eliminate hot spots in densely populated environments.

Configuration:

- Air-cooled
- Fluid-cooled

Compliance Approval:

- UL Listed
- CE
- C-Tick
- C-UL Listed
- VDE (ACRP 100 series only)

Standard Features

All series:

- Variable-speed fans
- Remote shutdown input
- Common alarm output
- Internal condensate pump
- Top or bottom piping
- Network Management Card (NMC)
- Remote temperature sensors
- Microprocessor controller
- Insulated cabinet

ACRD100 series and ACRD200 series only:

- Washable filter
- Condensate management with two dual floats
- Condensate pumps
- Scroll compressor
- Hot gas bypass
- 2-way/3-way floating point valve (ACRD200 series only)
- Liquid line solenoid valve (ACRD100 series only)

ACRD500/ACRP100 series only:

- Backward inclined impeller
- Pleated 100-mm (4-in) filter
- Condensate management with one dual float
- Variable speed reciprocating compressor using VFD control
- Pressure equalization solenoid
- Pipe adapters
- Electric reheat (ACRP100 series only)
- Humidifier (ACRP100 series only)

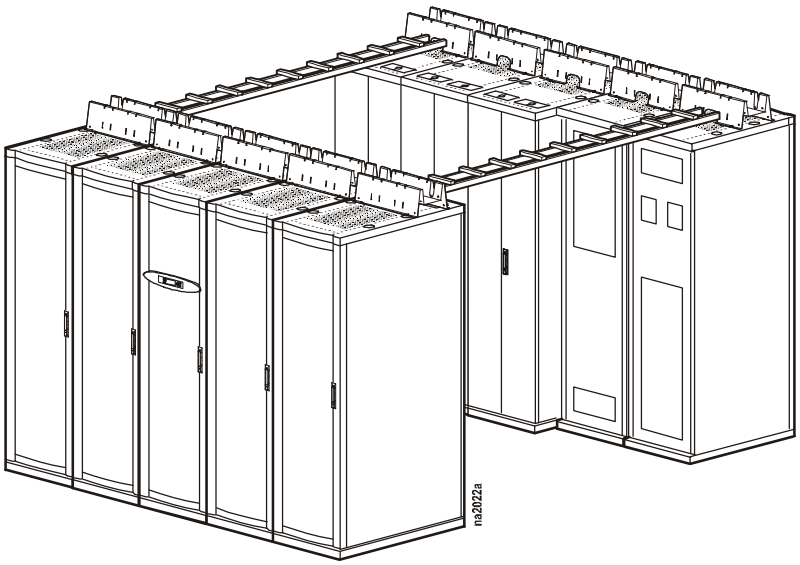
Accessories

- Cable leak detector
- Baying kit-InRow DX to NetShelter VX rack
- NetShelter SX 42-U to 48-U height adapters
- NetShelter VX 42-U height adapters
- Bridge trough power cable shield
- Data cable bridge partition
- Isolation ball valves (ACRD100 series only)
- Fluid cooler
- Condenser
- Aisle containment
- Rack containment

Scalable Solution for Critical Environments

InRow Advantages

The row-based solution improves energy efficiency and cooling ability in a number of ways. First, the InRow DX draws air directly from the hot aisle, allowing the InRow DX to take advantage of higher heat transfer efficiency due to higher temperature differences. It can then discharge room-temperature air directly in front of the servers it is cooling. Placing the cooling unit in the row enables the unit to operate at higher return and supply air temperature, yielding 100% sensible capacity. This significantly reduces the need for humidification.



Scalable for High Density

The predictable performance of the row-based architecture makes it well-suited for high density applications. The focus on heat removal instead of cold air delivery is the key to making this approach scalable. The modular design of the InRow DX allows it to be easily added in the row as the demand for cooling increases.

The additional benefit of the row-based architecture is the ability to add hot aisle containment. Containing the hot aisle further reduces any chance of hot and cold air streams mixing. This provides ultimate predictability and allows the cooling capacity to be matched to the IT heat load.

Cabinet

The frame is constructed of 16 gauge formed steel for maximum strength. The cabinet is serviceable from the front and rear. All exterior panels and corner posts on the frame are powder coated for durability and an attractive finish. The front and rear exterior panels are constructed of 18 gauge perforated steel with 69.5% open free area. All panels, which include a key latch for safety and security, allow easy access and removal. Insulation (ACRD100 and ACRD200 series only) is 80.1 kg/m^3 (5 lb/ft^3) density and complies with ASTM E84 rating of 25/50.

Shutdown input/alarm output

The unit provides one field connection input for remote shutdown and one field connection alarm output.

Variable speed fans

Each unit is equipped with variable speed fans to allow for varying heat loads. In order to provide uniform airflow over the cooling coil, the fans provide a draw-through air pattern. The ACRD100 and ACRD200 series units are equipped with six direct drive fan modules. These fans are easily replaceable while the unit is in operation. The ACRD500 and ACRP100 series is equipped with two backward inclined, direct drive fans.

Bay Kit-InRow DX/NetShelter SX

Baying kits made of 16 gauge steel enable baying the InRow DX to APC NetShelter enclosures.

Counterflow Cooling Coil/Condensate Pan

Designed for high sensible heat ratios, the coil is constructed with copper tubes, raised lance type aluminum fins, and 18 gauge galvanized steel end plates. Coil headers are equipped with anti-drip shields in the event of condensation. The condensate pan is thermal formed non-ferrous material, and is sloped for positive drainage to provide higher indoor air quality.

Filters

Filtration of conditioned air is extremely vital to maintaining the clean, particle-free environment required by electrical equipment. Filters are easily replaceable from the rear of the unit. The ACRD100 and 200 series systems use greater-than 20% efficiency ASHRAE 52.1, 12.7 mm (1/2 in) washable filters that meet HF-1 standards for electronics (MERV 1 per ASHRAE 52.2). The ACRD500/ACRP100 series system uses a 30% efficient, 102 mm (4 in), deep loading, pleated filter (MERV 8 per ASHRAE 52.2, EN779 G4).

Selectable top or bottom piping connections

The unit includes both top and bottom piping connections. All ACRD100 and ACRP500 series connections use threaded ring seals for ease of installation and service. The ACRD200 series uses union connectors.

Network Management Card

The Network Management Card (NMC) allows communication with the Local Area Network (LAN). In addition, the NMC permits multi-level access to monitoring, control, and event notification features over the building network.

Condensate pump

ACRD100 and ACRD200 series:

A condensate pump is factory wired and piped internally to the condensate drain pan. The pump is capable of pumping 34 l/h (9 g/hr) against head pressures of up to 50 ft (15.2 m) of total run. Of that run, 16 ft (4.9 m) can be vertical lift as measured from floor level. Dual floats are included with the unit. One float is used for condensate pump control, and the other float generates a condensate pump failure alarm. The InRow DX can be set to either continue running in an alarm condition or shut down to prevent condensate pan overflow.

ACRD500 and ACRP100 series:

A condensate pump is factory wired and piped internally to the condensate drain pan. The pump is capable of pumping a maximum of 18 m (60 ft) at 32 l/h (8.45 g/hr), which may include a maximum lift of 3.5 m (11.5 ft) as measured from floor level. Within the condensate pump, there is a dual position float. The first position is used for condensate pump control and the other float generates a condensate pump failure alarm to prevent condensate pan overflow.

Remote temperature sensors

To control the unit based on rack inlet temperature, remote temperature sensors are provided. The ACRD100 and ACRD200 series units come equipped with one temperature sensor, and the ACRD500 and ACRP100 series units come equipped with three. These sensors measure temperature at a point 4 m (13 ft) from the connection inside the InRow DX unit. These sensors are used for remote placement in the field on an adjacent IT rack.

Electric reheat (ACRP100 series only)

Electric reheat elements are low watt density, wired for three-phase and loaded equally on all three phases, and electrically and thermally protected by both automatic and manual reset thermal cut outs. Reheat elements are stainless steel, fin tubular construction.

Pipe adapters (ACRD500 and ACRP100 series only)

Standard pipe connections are 31.75 mm (1 1/4 in) 12 UNF female threaded ring seal (manufactured in accordance with ANSI B1.1). The adapter converts the threaded ring seal to a sweat adapter.

Humidifier (ACRP100 series only)

The humidifier is a self-contained, steam-generating type, factory piped and wired, with a disposable cylinder and an automatic solid state control circuit. Humidifier canisters are replaceable. The humidifier controller communicates directly to the microprocessor controller and provides complete status and control at the operator interface.

Optional Features

Cable water detector

A leak detection cable is placed on the floor or subfloor around all possible leak sources. If water or other conductive liquids contact the cable anywhere along its length, the microprocessor controller announces the leak visually, audibly, and across the network. The 6.1-m (20-ft) cable may be cascaded to make custom lengths up to 24.4 m (80-ft).

Network cable

Various lengths of network cable are available to ship with your cooling system. The network cable is used to interconnect multiple cooling units in a redundant group, as well as to connect the Network Management Card to your LAN.

Filters

Electrical equipment requires clean, particle free air, thus making air filtration extremely important. As an optional feature, higher efficiency filters can be purchased for the InRow DX units. The ACRD100 and ACRD200 series units optionally use an 50.8 mm (2 in) pleated, deep loading, 30% ASHRAE 52.1 filter (MERV 8 per ASHRAE 52.2). The ACRD500 and ACRP100 series units optionally use 102 mm (4 in) pleated, deep loading, 85% ASHRAE 52.1 filter (MERV13 per ASHRAE 52.2).

Power Trough

Overhead power distribution between adjacent NetShelter racks allows for removal of the InRow DX without disrupting overhead power cabling.

Data Partition

Overhead cable distribution between adjacent NetShelter racks allows for removal of the InRow RP without disrupting overhead cabling.

Height Adapters

To match height of the InRow RP to various rack heights, height adapters are available for NetShelter 42U VX and 48U SX racks.

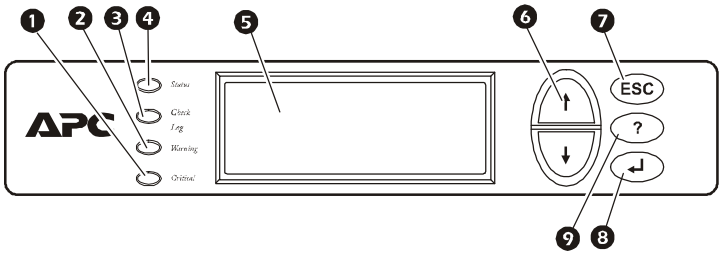
Hot Aisle Containment System

Modular ceiling tiles and doors can be used to enclose the hot aisle. This increases the densities that can be handled in a single rack enclosure by eliminating mixing of hot and cold air streams. This method, called load neutralization, removes the heat from the hot aisle, cools it, and then returns it to the surrounding room area at or slightly below room temperature. The warmer return air temperatures that are achieved in this application increase the capacity of the air conditioner.

Use of modular ceiling tiles across a 914.4-mm (3-ft) hot aisle that connects two opposite rack enclosures makes expansion quick and simple. Expansion kits, with the necessary ceiling tile and all baying hardware, can be ordered to increase the size of the hot aisle by one rack on each side. The end doors can be easily removed and re-attached for expansion.

The enclosed hot aisle prevents any warm return air from mixing with cold supply air. In effect, all surrounding room air can act as supply air to the system. The hot aisle containment system is beneficial in any environment. It can be deployed quickly in any controlled space without expensive additions to the infrastructure, such as raised flooring or ductwork.

Microprocessor Controller



1	Critical Alarm LED
2	Warning Alarm LED
3	Check Log LED
4	Status LED
5	Liquid Crystal Display (LCD)
6	Menu Selection scroll keys
7	Escape key
8	Enter key
9	Help key

Microprocessor controller

The microprocessor controller is standard on each system. The controller provides precision control for the demanding requirements of:

- Computer rooms
- Telecommunication facilities
- Clean rooms
- Power equipment
- Medical equipment rooms
- LAN/WAN environments

The easy-to-use display allows the operator to select options from the device's menu-driven interface to control and monitor the connected air conditioning system.

Open Architecture

The InRow Direct Expansion protocol is open for integration with all building management systems. Communication interface on the system can be MODBUS RS485 or Ethernet.

Control Type

The controller uses proportional/integral/derivative (PID), a time-proven precision environmental control method. This allows for custom tuning of control variables to achieve desired system response.

Functions

- Supply and Return Air Conditions
- Operational Mode Control
- Event Logging
- Alarms
- Redundant Group Control
- Fan Speed Adjustment
- Input/Output Module Programming

Logging

The event log keeps a record of all alarms and events. Each event log contains a time/date stamp. The controller also displays run time, in hours, for major components (air filters, fans, and condensate pump, as well as humidifier, heater, and compressor for the air-cooled unit).

Control

The backlit, four-line by twenty-character display is password configurable.

Alarms

The microprocessor controller shall activate a visible and audible alarm in the following occurrences:

All series:

- Cool Fail
- Air filter clogged
- Return air sensor fault
- Supply air sensor fault
- Rack temperature sensor fault
- High discharge pressure
- Low suction pressure
- Fan fault
- Water detected (if optional leak detector used)
- Check condensate management system
- Air filter run hours violation
- Group communication fault
- Supply air high temperature violation
- Return air high temperature violation
- Filter DP sensor failure
- Suction pressure sensor failure
- Discharge pressure sensor failure
- Persistent high discharge pressure fault
- Rack inlet temperature high violation
- External communication fault
- Internal communication fault
- On standby input contact fault
- A-link isolation relay fault

ACRD100 series and ACRD200 series only:

- Condensate pan full
- Upper fan power supply fault
- Lower fan power supply fault
- Suction temperature sensor failure
- Persistent low suction pressure fault
- Factory configuration not completed
- Liquid refrigerant sensor failure

ACRD200 series only:

- Condenser fluid valve actuator fault
- Outdoor heat exchanger (OHE) fault

ACRD500/ACRP100 series only:

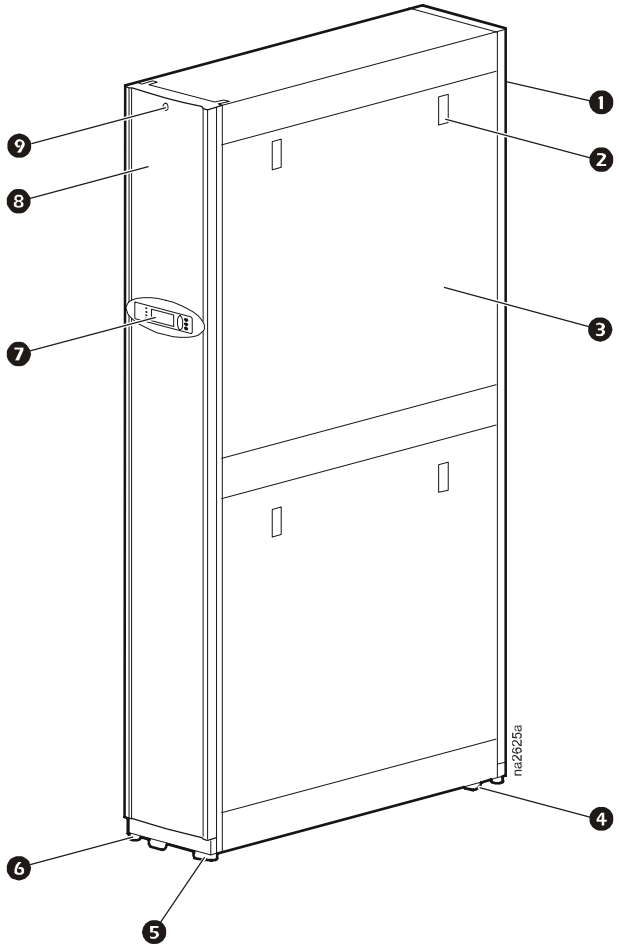
- Compressor drive communication fault
- Compressor drive fault
- Compressor drive warning
- Compressor run hours violation
- Condensate pump run hours violation
- Fan run hours violation
- Invalid supply setpoint
- Idle mode active
- High pressure switch active
- Compressor high pressure
- Supply humidity sensor fault
- High suction pressure
- Excessive compressor cycling

ACRP100 series only:

- Humidifier water conductivity high violation
- Humidifier fault tolerance exceeded
- Humidifier low water
- Humidifier excessive output reduction
- Humidifier drain fault
- Humidifier cylinder full
- Humidifier replace cylinder
- Humidifier RS485 communication fault
- Humidifier run hours violation
- Humidity high/low violation
- Return humidity sensor fault
- Heater fault
- Heater run hours exceeded
- Heater interlock shutdown

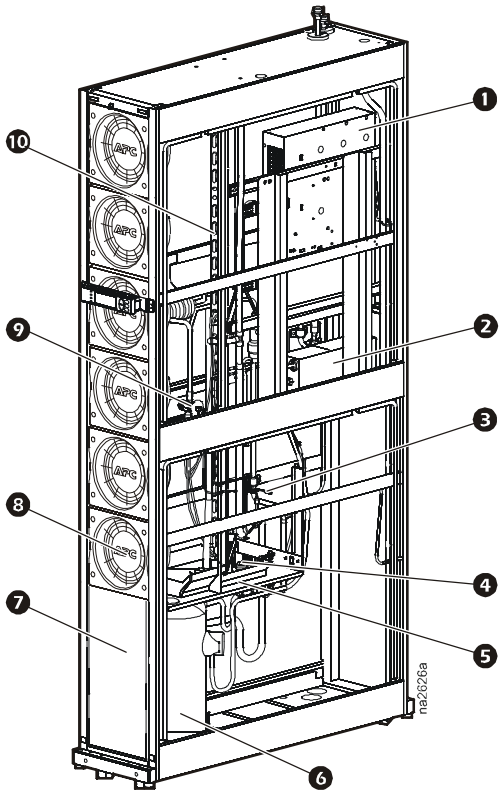
InRow DX Models

Exterior components: ACRD100 and ACRD200 series



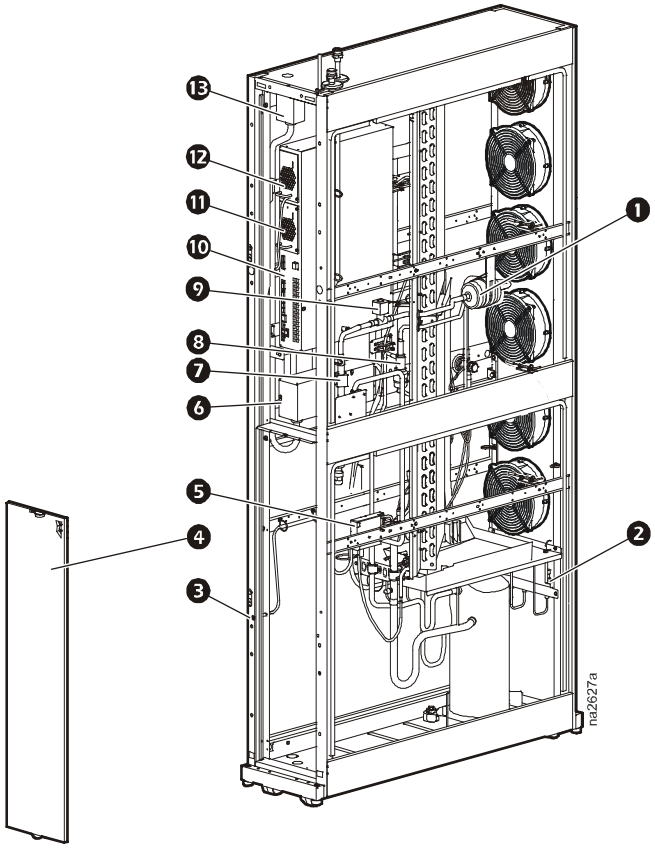
❶	Removable rear door	❻	Adjustable leveling feet
❷	Side panel latch	❼	Display interface
❸	Removable side panel	❽	Removable front door
❹	Rear casters (non-swiveling)	❾	Door lock (front and rear)
❺	Front casters (swiveling)		

Interior components (front): ACRD100 series



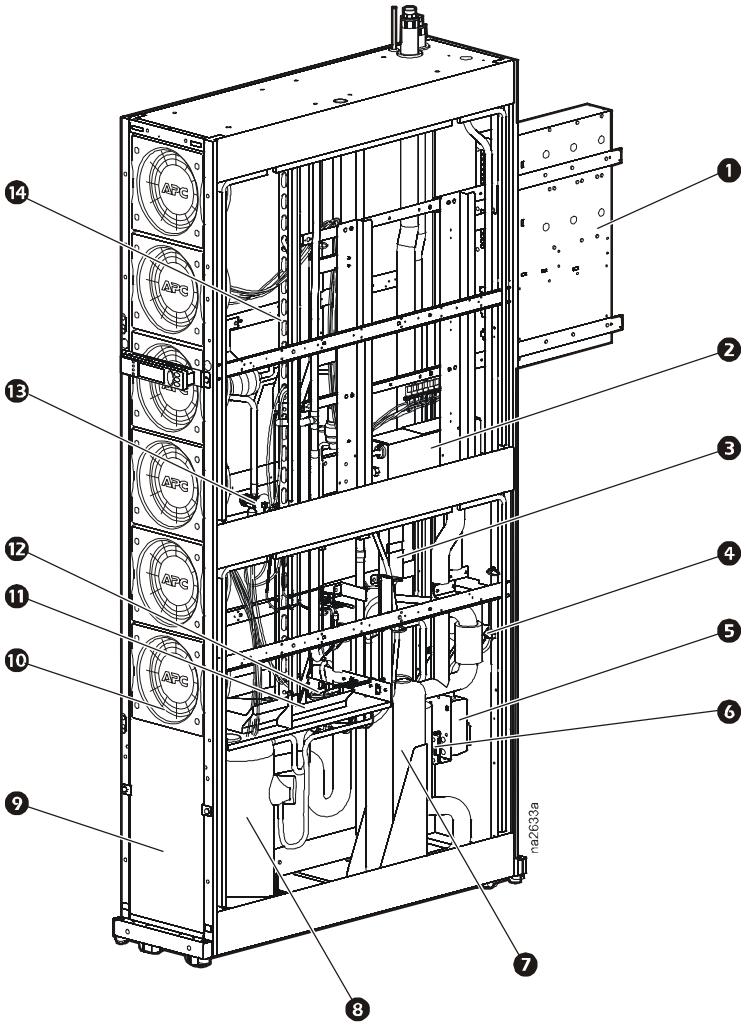
❶	Electrical control box 1 (retractable)	❻	Compressor
❷	Electrical control box 2	❼	Front air block panel
❸	Return air temperature sensor	❽	Evaporator fans (6 total)
❹	Condensate pan floats (2 total)	❾	Expansion valve
❺	Condensate pan	❿	Evaporator coil

Interior components (rear): ACRD100 series



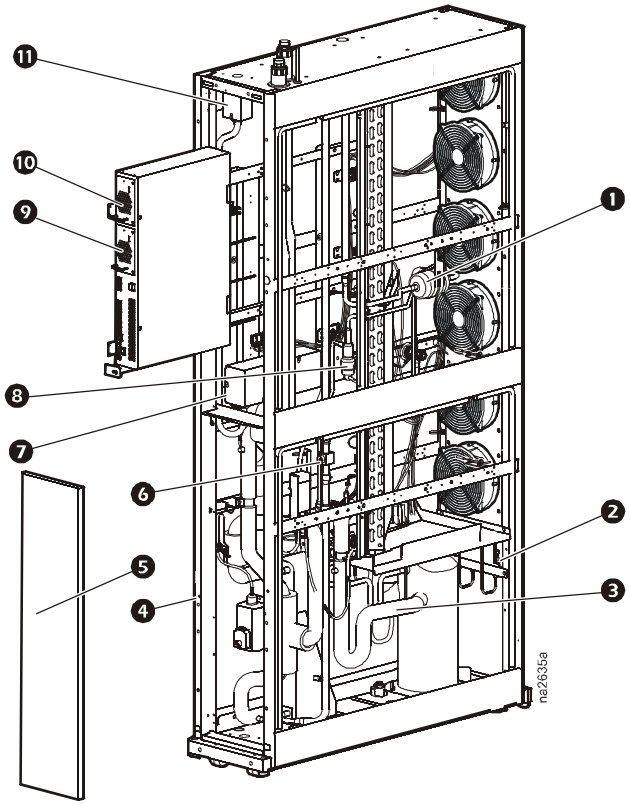
1. Filter/dryer
2. Pressure transducer (2 total, located behind air block)
3. Filter differential pressure port
4. Air filter (2 total)
5. Condensate pump (2 total)
6. Electrical control box 2
7. Sight glass
8. Hot gas bypass valve
9. Liquid line shutoff solenoid
10. Electrical control box 1
11. Power supply unit (bottom)
12. Power supply unit (top)
13. Service junction box (top entry shown)

Interior components (front): ACRD200 series



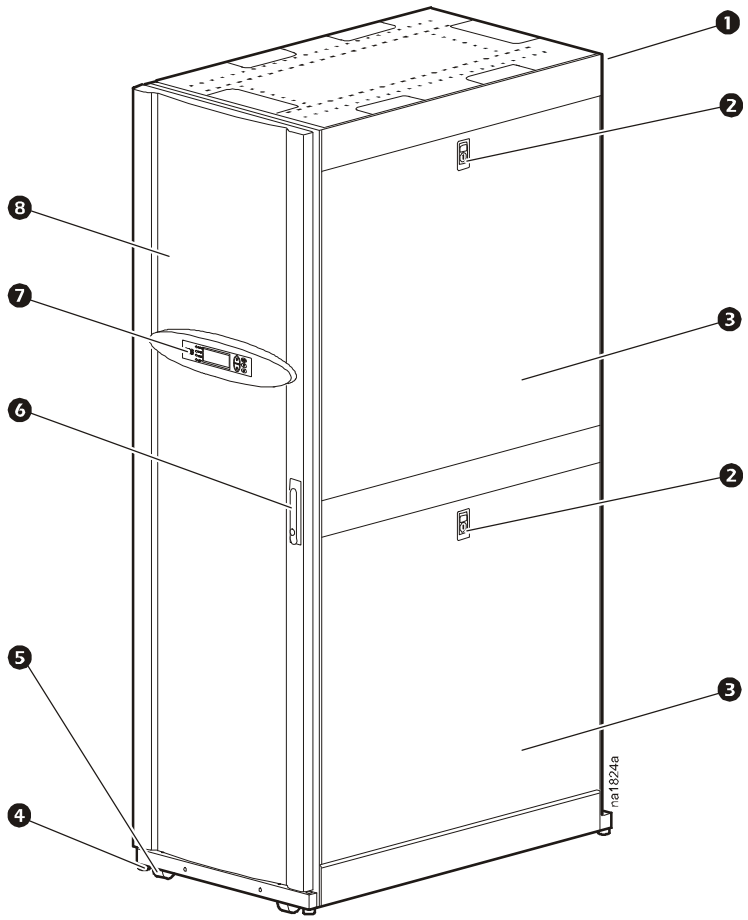
❶	Electrical control box 1 (retractable)	❽	Compressor
❷	Electrical control box 2	❾	Front air block panel
❸	Condensate pumps	❿	Evaporator fans (6 total)
❹	Bypass shutoff valve (2-way)	⓫	Condensate pan
❺	Water control actuator	⓬	Condensate pan floats (2 total)
❻	Water regulating valve (3-way)	⓭	Expansion valve
❼	Brazed plate heat exchanger	⓮	Evaporator coil

Interior components (rear): ACRD200 series



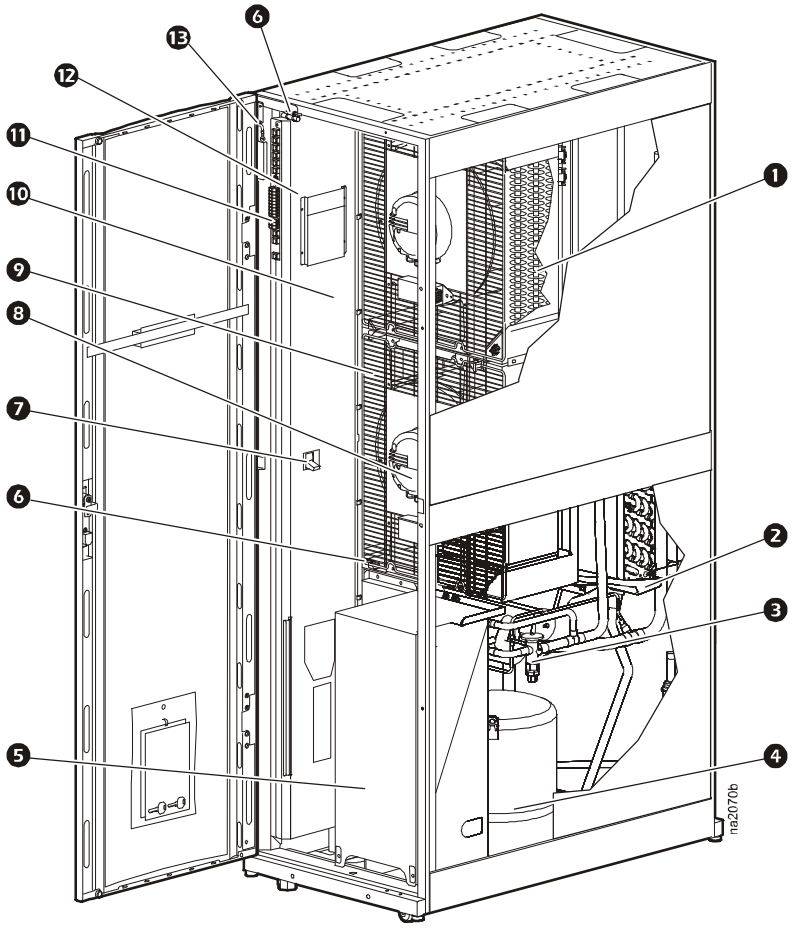
1. Filter/dryer
2. Pressure transducer (2 total, located behind airblock)
3. Suction line
4. Filter differential pressure port
5. Air filters (2 total)
6. Sight glass
7. Electrical control box 2
8. Hot gas bypass valve
9. Power supply unit (bottom)
10. Power supply unit (top)
11. Service junction box (top entry shown)

Exterior components: ACRD500/ACRP100 series



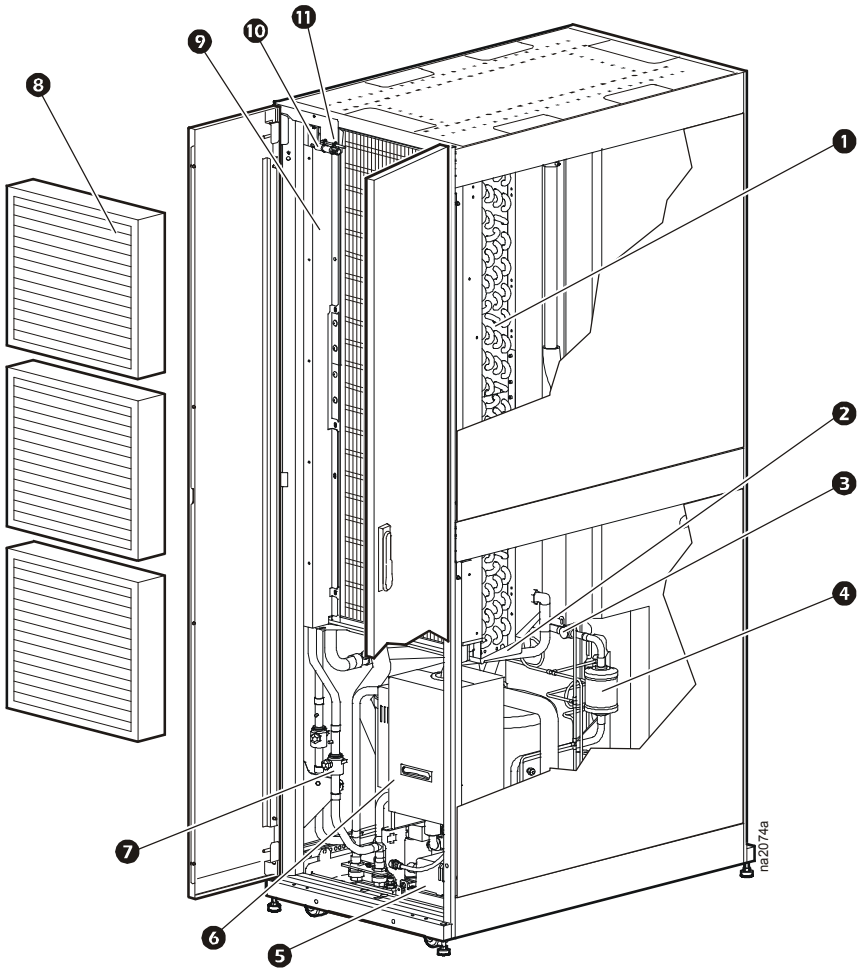
1	Removable rear doors	5	Casters (all swiveling)
2	Side panel lock	6	Door handle and lock
3	Removable side panel	7	Display interface
4	Adjustable leveling feet	8	Removable front door

Interior components (front): ACRD500/ACRP100 series



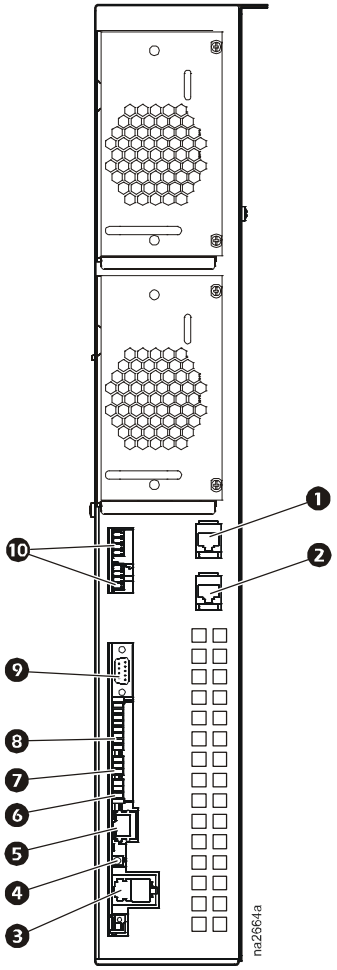
❶	Electric heater (ACRP100 series only)	❽	Fan
❷	Condensate drain pan	❾	Fan guard
❸	Thermal expansion valve	❿	Electric Panel
❹	Compressor	⓫	Customer Communications Interface
❺	Variable Frequency Drive (for compressor)	⓬	Ladder diagrams
❻	Supply air temperature sensor	⓭	Ground Wire
❼	Main circuit breaker	⓮	Humidity sensor

Air-cooled interior components—ACRD500/ACRP100 series (back of unit)



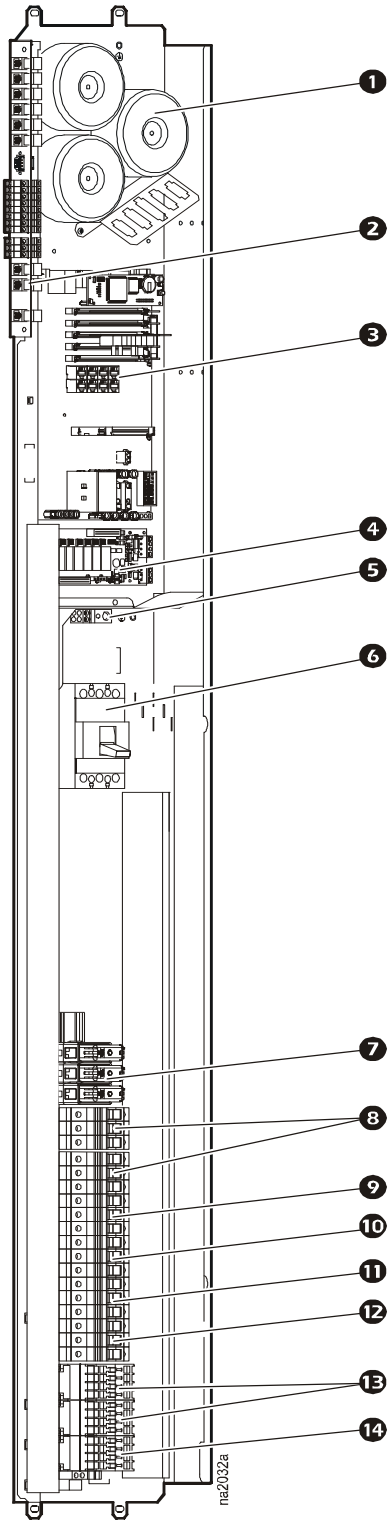
❶	Evaporator coil	❼	Shutoff valves (top piping only)
❷	Condensate drain pan	❽	Air filters
❸	Sight glass	❾	Pipe chase
❹	Filter dryer	❿	Humidity sensor (ACRP100 series only)
❺	Condensate pump	⓫	Return air temperature sensor
❻	Humidifier (ACRP100 series only)		

Electrical panel: ACRD100 and ACRD200 series



❶	Leak detector port	❻	Building management system (BMS) RS-485 port
❷	Remote temperature sensor port	❼	Control RS-485 port
❸	A-Link ports	❽	Form C and shutdown input
❹	Reset button	❾	RS-232 console port
❺	Network port	❿	Outdoor heat exchanger (OHE) input and output ports (optional connection for ACRD100 and ACRD101)

Electrical panel:ACRD500/ACRP100 series



1. Transformers
2. User interface connectors
3. Main controller board
4. Relay board
5. Ground lug
6. Main circuit breaker
7. • Compressor fuse block (ACRP100, ACRP101, ACRD500, ACRD501

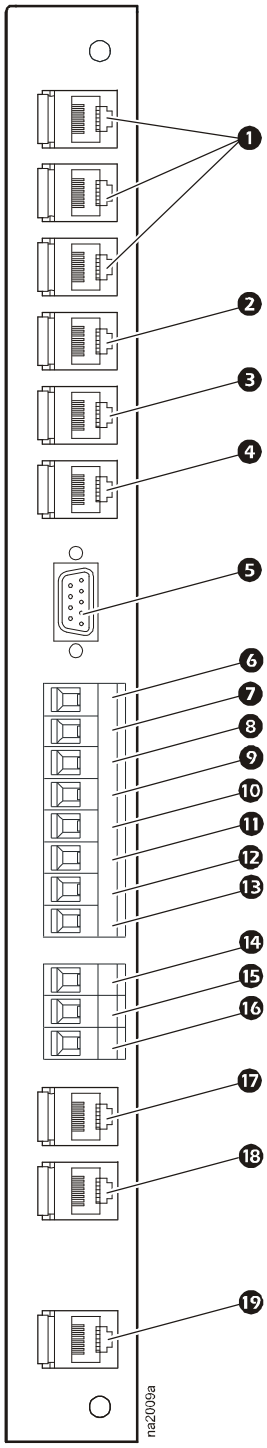
   OR

   • Compressor circuit breaker (ACRP102 and ACRD502)
8. Fan circuit breakers
9. Controller circuit breaker
10. Humidifier circuit breaker (ACRP100 series)
11. Heater circuit breaker (ACRP100)
12. Heater contactors (ACRP100 series)
13. Humidifier contactor (ACRP100)

Note: For a top installation, control wiring is routed through the wire channel located at the top left hand corner just above the user interface connectors.

For a bottom installation, the control wiring is routed to the access hole in the bottom of the equipment through wire clamps from the interface connectors. Then, the wiring is routed down along the electrical panel and secured with wire clamps.

User interface panel: ACRD500/ACRP100 series



❶ Rack inlet temperature sensors 1, 2, 3

❷ A-Link IN

❸ A-Link OUT

❹ Network port

❺ Console port

❻ Alarm output, NC (Normally Closed)

❼ Alarm output, COM (Common)

❽ Alarm output, NO (Normally Open)

❾ Supply GND (Ground)

❿ Supply 12 VDC (current limit: 20 mA)

⓫ Supply 24 VDC (current limit: 20 mA)

⓬ Remote shutdown+ (12–30 VAC/VDC, 24 VDC @ 11 mA)

⓭ Remote shutdown-

⓮ BMS D1 (RXTX+)

⓯ BMS D0 (RXTX–)

⓰ BMS GND

⓱ Supply air temperature sensor (front)

⓲ Supply air humidity sensor (front)

⓳ Display interface

Performance Specifications

Net cooling capacity (air and glycol cooled)

Return Air Temperature	Model	Total Capacity kW (BTU/hr)	Sensible Capacity kW (BTU/hr)
22.2°C DB, 15.5°C WB (72°F DB, 60°F WB)	ACRD100	8.22 (28,000)	8.04 (27,400)
	ACRD101	8.01 (27,200)	7.71 (26,400)
	ACRD200	8.22 (28,000)	8.04 (27,400)
	ACRD201	8.01 (27,200)	7.71 (26,400)
	ACRD500/ACRP100 series	22.8 (78,000)	19.0 (65,000)
23.9°C DB, 16.2°C WB (75°F DB, 61.1°F WB)	ACRD100	8.52 (29,000)	8.52 (29,000)
	ACRD101	8.16 (27,900)	8.16 (27,900)
	ACRD200	8.52 (29,000)	8.52 (29,000)
	ACRD201	8.16 (27,900)	8.16 (27,900)
	ACRD500/ACRP100 series	25.2 (86,000)	21.7 (74,000)
26.7°C DB, 19.4°C WB (80°F DB, 67.0°F WB)	ACRD100	10.02 (34,000)	9.12 (31,000)
	ACRD101	9.72 (33,200)	8.85 (30,200)
	ACRD200	10.02 (34,000)	9.12 (31,000)
	ACRD201	9.72 (33,200)	8.85 (30,200)
	ACRD500/ACRP100 series	N/A	N/A
26.7°C DB, 17.1°C WB (80°F DB, 62.8°F WB)	ACRD100	9.36 (32,000)	9.36 (32,000)
	ACRD101	8.97 (30,700)	8.97 (30,700)
	ACRD200	10.02 (34,000)	9.12 (31,000)
	ACRD201	9.72 (33,200)	8.85 (30,200)
	ACRD500/ACRP100 series	26.9 (92,000)	26.9 (92,000)
29.4°C DB, 18.1°C WB (85°F DB, 64.6°F WB)	ACRD100	9.90 (33,800)	9.90 (33,800)
	ACRD101	9.69 (33,100)	9.69 (33,100)
	ACRD200	9.90 (33,800)	9.90 (33,800)
	ACRD201	9.69 (33,100)	9.69 (33,100)
	ACRD500/ACRP100 series	29.0 (99,000)	29.0 (99,000)
32.2°C DB, 19.0°C WB (90°F DB, 66.2°F WB) [1]Airflow is reduced to 887 l/s (1880 SCFM) at this condition to maintain adequate evaporating temperature.	ACRD100[1]	10.44 (35,600)	10.44 (35,600)
	ACRD101[1]	10.29 (35,200)	10.29 (35,200)
	ACRD200[1]	10.44 (35,600)	10.44 (35,600)
	ACRD201[1]	10.29 (35,200)	10.29 (35,200)
	ACRD500/ACRP100 series	30.5 (104,000)	30.5 (104,000)
35.0°C DB, 19.9°C WB (95°F DB, 67.8°F WB) [2]Airflow is reduced to 717 l/s (1520 SCFM) at this condition to maintain adequate evaporating temperature	ACRD100[2]	10.62 (36,200)	10.62 (36,200)
	ACRD101[2]	10.5 (35,900)	10.5 (35,900)
	ACRD200[2]	10.62 (36,200)	10.62 (36,200)
	ACRD201[2]	10.5 (35,900)	10.5 (35,900)
	ACRD500/ACRP100 series	33.7 (115,000)	33.7 (115,000)
37.8°C DB, 20.7°C WB (100°F DB, 69.3°F WB) [3]Airflow is reduced to 599 l/s (1270 SCFM) at this condition to maintain adequate evaporating temperature.	ACRD100[3]	10.62 (36,200)	10.62 (36,200)
	ACRD101[3]	10.5 (35,900)	10.5 (35,900)
	ACRD200[3]	10.62 (36,200)	10.62 (36,200)
	ACRD201[3]	10.5 (35,900)	10.5 (35,900)
	ACRD500/ACRP100 series	36.9 (126,000)	36.9 (126,000)
40.6°C DB, 21.6°C WB) (105°F DB, 70.8°F WB [4]Airflow is reduced to 510 l/s (1080 SCFM) at this condition to maintain adequate evaporating temperature	ACRD100[4]	10.56 (36,000)	10.56 (36,000)
	ACRD101[4]	10.5 (35,900)	10.5 (35,900)
	ACRD200[4]	10.56 (36,000)	10.56 (36,000)
	ACRD201[4]	10.5 (35,900)	10.5 (35,900)
	ACRD500/ACRP100 series*	36.6 (125,000)	36.6 (125,000)

Return Air Temperature	Model	Total Capacity kW (BTU/hr)	Sensible Capacity kW (BTU/hr)
43.3°C DB, 22.2°C WB) (110°F DB, 72.0°F WB [5]Airflow is reduced to 448 l/s (950 SCFM) at this condition to maintain adequate evaporating temperature.	ACRD100[5]	10.6 (36,000)	10.6 (36,000)
	ACRD101[5]	10.5 (35,900)	10.5 (35,900)
	ACRD200[5]	10.6 (36,000)	10.6 (36,000)
	ACRD201[5]	10.5 (35,900)	10.5 (35,900)

*Airflow reduced to 4000 SCFM at this condition to maintain adequate return gas temperature.
Airflow at full evaporating fan speed: ACRD100/200 series – 1081 l/s (2290 SCFM); ACRD500/ACRP100 series – 2171 l/s (4600 SCFM).
Minimum recommended loads: ACRD100/200 series – 2kW (6,831 BTU); ACRD500/ACRP100 series – 10kW (34,152 BTU)
Note: For ACRD100, ACRD500, and ACRP100 series the outdoor air temperature is 35°C (95°F)
Note: For ACRD200 series, a 40% at 0.64 l/s (10gpm), the entering glycol mixture temperature is 40.6°C (105°F)
Note: For ACRD500 series, reduce airflow and cooling capacity specifications by 7% for cooling units run at low input voltage (380V).

Net Cooling Capacity (Water Cooled)

Return Air Temperature	Model	Total Capacity kW (BTU/hr)	Sensible Capacity kW (BTU/hr)
22.2°C DB, 15.5°C WB (72°F DB, 60°F WB)	ACRD200	9.72 (33,200)	8.94 (30,500)
	ACRD201	9.57 (32,700)	8.79 (30,100)
23.9°C DB, 16.2°C WB (75°F DB, 61.1°F WB)	ACRD200	8.43 (32,200)	8.43 (32,200)
	ACRD201	9.30 (31,800)	9.30 (31,800)
26.7°C DB, 19.4°C WB (80°F DB, 67.0°F WB)	ACRD200	11.52 (39,300)	9.90 (33,800)
	ACRD201	11.64 (39,800)	9.99 (34,200)
26.7°C DB, 17.1°C WB (80°F DB, 62.8°F WB)	ACRD200	10.38 (35,400)	10.38 (35,400)
	ACRD201	10.11 (34,500)	10.11 (34,500)
29.4°C DB, 18.1°C WB (85°F DB, 64.6°F WB)	ACRD200	10.92 (37,300)	10.92 (37,300)
	ACRD201	10.98 (37,500)	10.98 (37,500)
32.2°C DB, 19.0°C WB (90°F DB, 66.2°F WB) Note: Airflow is reduced to 887 l/s (1880 SCFM) at this condition to maintain adequate evaporating temperature.	ACRD200	11.64 (39,700)	11.64 (39,700)
	ACRD201	11.76 (40,200)	11.76 (40,200)
35.0°C DB, 19.9°C WB (95°F DB, 67.8°F WB) Note: Airflow is reduced to 717 l/s (1520 SCFM) at this condition to maintain adequate evaporating temperature.	ACRD200	12.00 (41,000)	12.00 (40,900)
	ACRD201	12.00 (41,000)	12.00 (41,000)
37.8°C DB, 20.7°C WB (100°F DB, 69.3°F WB) Note: Airflow is reduced to 599 l/s (1270 SCFM) at this condition to maintain adequate evaporating temperature.	ACRD200	12.06 (41,200)	12.06 (41,200)
	ACRD201	12.00 (41,000)	12.00 (41,000)
40.6°C DB, 21.6°C WB) (105°F DB, 70.8°F WB Note: Airflow is reduced to 510 l/s (1080 SCFM) at this condition to maintain adequate evaporating temperature.	ACRD200	12.06 (41,000)	12.00 (41,000)
	ACRD201	12.00 (41,000)	12.00 (41,000)
43.3°C DB, 22.2°C WB) (110°F DB, 72.0°F WB Note: Airflow is reduced to 448 l/s (950 SCFM) at this condition to maintain adequate evaporating temperature.	ACRD200	12.06 (41,200)	12.06 (41,200)
	ACRD201	12.06 (41,200)	12.06 (41,200)

Airflow for the ACRD200 series is 1081 l/s (2290 SCFM) at full evaporating fan speed.
Note: Minimum recommended loads: ACRD200 series - 2kW (6,831 BTU)
Note: For ACRD200 series, a 0.64 l/s (10gpm) entering water temperature is 29.4°C (85°F)

Performance at Percentage of Fan Speed

ACRD100 series

% Fan Speed	Voltage/Phase/Hz	L/S (SCFM)	Unit Power in kW	Condenser Fan Power in kW	Net Sensible Capacity kW (BTU/h)	SA Temp °C (°F)
Return Air Temperature – 29.4°C (85°F)						
30	200-240/1/60	448 (950)	2.57	0.13	4.60 (15,710)	20.8 (69.5)
	200-240/1/50		2.58	0.13	4.60 (15,710)	20.8 (69.5)
40	200-240/1/60	562 (1190)	2.67	0.18	5.75 (19,637)	20.8 (69.5)
	200-240/1/50		2.70	0.20	5.75 (19,637)	20.8 (69.5)
50	200-240/1/60	947 (1370)	2.76	0.23	6.65 (22,711)	20.8 (69.5)
	200-240/1/50		2.80	0.25	6.65 (22,711)	20.8 (69.5)
60	200-240/1/60	717 (1520)	2.86	0.28	7.35 (25,102)	20.8 (69.5)
	200-240/1/50		2.90	0.29	7.35 (25,102)	20.8 (69.5)
70	200-240/1/60	779 (1650)	2.92	0.32	8.00 (27,321)	20.8 (69.5)
	200-240/1/50		2.98	0.35	8.00 (27,321)	20.8 (69.5)
80	200-240/1/60	850 (1800)	3.04	0.38	8.70 (29,712)	20.8 (69.5)
	200-240/1/50		3.08	0.40	8.70 (29,712)	20.8 (69.5)
90	200-240/1/60	944 (2000)	3.19	0.47	9.70 (33,127)	20.8 (69.5)
	200-240/1/50		3.22	0.49	9.70 (33,127)	20.8 (69.5)
100	200-240/1/60	1081 (2290)	3.46	0.50	9.90 (33,810)	21.7 (71.1)
	200-240/1/50		3.50	0.51	9.90 (33,810)	21.9 (71.5)
Return Air Temperature – 35°C (95°F)						
30	200-240/1/60	448 (950)	2.68	0.28	7.55 (25,785)	20.8 (69.5)
	200-240/1/50		2.70	0.30	7.55 (25,785)	20.8 (69.5)
40	200-240/1/60	562 (1190)	2.80	0.42	9.50 (32,444)	20.8 (69.5)
	200-240/1/50		2.81	0.44	9.50 (32,444)	20.8 (69.5)
50	200-240/1/60	947 (1370)	2.89	0.48	10.20 (34,835)	21.8 (71.2)
	200-240/1/50		2.91	0.48	9.90 (33,810)	22.2 (71.9)
60	200-240/1/60	717 (1520)	3.00	0.52	10.62 (36,269)	22.6 (72.6)
	200-240/1/50		3.01	0.50	10.29 (35,142)	23.1 (73.5)
70	200-240/1/60	N/A	N/A	N/A	N/A	N/A
	200-240/1/50		N/A	N/A	N/A	N/A
80	200-240/1/60	N/A	N/A	N/A	N/A	N/A
	200-240/1/50		N/A	N/A	N/A	N/A
90	200-240/1/60	N/A	N/A	N/A	N/A	N/A
	200-240/1/50		N/A	N/A	N/A	N/A
100	200-240/1/60	N/A	N/A	N/A	N/A	N/A
	200-240/1/50		N/A	N/A	N/A	N/A
Return Air Temperature – 40.6°C (105°F)						
30	200-240/1/60	448 (950)	2.78	0.47	10.20 (34,835)	21.3 (70.4)
	200-240/1/50		2.78	0.48	10.00 (34,152)	21.6 (70.9)
40	200-240/1/60	562 (1190)	2.85	0.51	10.56 (36,064)	24.8 (76.6)
	200-240/1/50		2.87	0.53	10.55 (36,030)	24.8 (76.6)
50	200-240/1/60	N/A	N/A	N/A	N/A	N/A
	200-240/1/50		N/A	N/A	N/A	N/A
60	200-240/1/60	N/A	N/A	N/A	N/A	N/A
	200-240/1/50		N/A	N/A	N/A	N/A
70	200-240/1/60	N/A	N/A	N/A	N/A	N/A
	200-240/1/50		N/A	N/A	N/A	N/A
80	200-240/1/60	N/A	N/A	N/A	N/A	N/A
	200-240/1/50		N/A	N/A	N/A	N/A

% Fan Speed	Voltage/Phase/Hz	L/S (SCFM)	Unit Power in kW	Condenser Fan Power in kW	Net Sensible Capacity kW (BTU/h)	SA Temp °C (°F)
90	200-240/1/60	N/A	N/A	N/A	N/A	N/A
	200-240/1/50		N/A	N/A	N/A	N/A
100	200-240/1/60	N/A	N/A	N/A	N/A	N/A
	200-240/1/50		N/A	N/A	N/A	N/A

ACRD200 series

% Fan Speed	Voltage/Phase/Hz	L/S (SCFM)	Unit Power in kW	Net Sensible Capacity kW (BTU/h)	SA Temp °C (°F)
Return Air Temperature – 29.4°C (85°F)					
30	200-240/1/60	448 (950)	2.35	4.60 (15,710)	20.8 (69.5)
	200-240/1/50		2.25	4.60 (15,710)	20.8 (69.5)
40	200-240/1/60	562 (1190)	2.41	5.76 (19,671)	20.8 (69.5)
	200-240/1/50		2.31	5.76 (19,671)	20.8 (69.5)
50	200-240/1/60	947 (1370)	2.47	6.63 (22,643)	20.8 (69.5)
	200-240/1/50		2.37	6.63 (22,643)	20.8 (69.5)
60	200-240/1/60	717 (1520)	2.55	7.36 (25,136)	20.8 (69.5)
	200-240/1/50		2.45	7.36 (25,136)	20.8 (69.5)
70	200-240/1/60	779 (1650)	2.60	8.00 (27,321)	20.8 (69.5)
	200-240/1/50		2.50	8.00 (27,321)	20.8 (69.5)
80	200-240/1/60	850 (1800)	2.68	8.70 (29,712)	20.8 (69.5)
	200-240/1/50		2.58	8.70 (29,712)	20.8 (69.5)
90	200-240/1/60	944 (2000)	2.80	9.70 (33,127)	20.8 (69.5)
	200-240/1/50		2.70	9.70 (33,127)	20.8 (69.5)
100	200-240/1/60	1081 (2290)	3.06	10.90 (37,225)	21.0 (69.8)
	200-240/1/50		3.00	10.98 (37,499)	20.9 (69.7)
Return Air Temperature – 35°C (95°F)					
30	200-240/1/60	448 (950)	2.25	7.50 (25,614)	20.8 (69.5)
	200-240/1/50		2.25	7.50 (25,614)	20.8 (69.5)
40	200-240/1/60	562 (1190)	2.31	9.50 (32.444)	20.8 (69.5)
	200-240/1/50		2.31	9.50 (32.444)	20.8 (69.5)
50	200-240/1/60	947 (1370)	2.37	10.50 (35,859)	21.2 (70.)
	200-240/1/50		2.37	10.50 (35,859)	21.2 (70.)
60	200-240/1/60	717 (1520)	2.50	11.35 (38,762)	21.8 (71.3)
	200-240/1/50		2.45	11.35 (38,762)	21.8 (71.3)
70	200-240/1/60	779 (1650)	2.61	11.75 (40,128)	22.4 (72.4)
	200-240/1/50		2.50	11.75 (40,128)	22.4 (72.4)
80	200-240/1/60	850 (1800)	2.71	12.00 (40,982)	23.2 (73.7)
	200-240/1/50		2.58	12.00 (40,982)	23.2 (73.7)
90	200-240/1/60	N/A	N/A	N/A	N/A
	200-240/1/50		N/A	N/A	N/A
100	200-240/1/60	N/A	N/A	N/A	N/A
	200-240/1/50		N/A	N/A	N/A
Return Air Temperature – 40.6°C (105°F)					
30	200-240/1/60	448 (950)	2.35	10.55 36,030)	20.8 (69.5)
	200-240/1/50		2.25	10.55 36,030)	20.8 (69.5)
40	200-240/1/60	562 (1190)	2.40	11.70 (39,958)	22.8 (73.0)
	200-240/1/50		2.31	11.70 (39,958)	22.8 (73.0)
50	200-240/1/60	947 (1370)	2.46	12.00 (40,982)	24.8 (76.7)
	200-240/1/50		2.37	12.00 (40,982)	24.8 (76.7)
60	200-240/1/60	N/A	N/A	N/A	N/A
	200-240/1/50		N/A	N/A	N/A
70	200-240/1/60	N/A	N/A	N/A	N/A
	200-240/1/50		N/A	N/A	N/A
80	200-240/1/60	N/A	N/A	N/A	N/A
	200-240/1/50		N/A	N/A	N/A
90	200-240/1/60	N/A	N/A	N/A	N/A
	200-240/1/50		N/A	N/A	N/A

% Fan Speed	Voltage/Phase/Hz	L/S (SCFM)	Unit Power in kW	Net Sensible Capacity kW (BTU/h)	SA Temp °C (°F)
100	200-240/1/60	N/A	N/A	N/A	N/A
	200-240/1/50		N/A	N/A	N/A

ACRD500/ACRP100 series (No humidifier/no reheat)

% Fan Speed	Voltage	L/S (SCFM)	Unit Power in kW	Condenser Fan Power in kW	Net Sensible Capacity kW (BTU/h)	SA Temp °C (°F)
Return Air Temperature – 29.4°C (85°F)						
30	All	700 (1400)	2.03	0.01	7.3 (24,931)	20.8 (69.5)*
40	All	900 (1800)	3.25	0.02	9.8 (33.469)	20.8 (69.5)*
50	All	1100 (2300)	4.28	0.03	12.1 (41,324)	20.8 (69.5)*
60	All	1300 (2800)	6.32	0.06	14.5 (49,520)	20.8 (69.5)
70	All	1500 (3200)	7.12	0.07	16.9 (57.717)	20.8 (69.5)
80	All	1700 (3700)	9.13	0.10	19.4 (66,254)	20.8 (69.5)
90	All	2000 (4100)	9.52	0.18	21.8 (74,451)	20.8 (69.5)
100	All	2200 (4600)	11.74	0.31	24.2 (82,647)	20.8 (69.5)
Return Air Temperature – 35°C (95°F)						
30	All	700 (1400)	4.28	0.05	11.95 (40,811)	20.8 (69.5)*
40	All	900 (1800)	6.51	0.08	15.93 (54,404)	20.8 (69.5)
50	All	1100 (2300)	7.65	0.14	19.91 (67,996)	20.8 (69.5)
60	All	1300 (2800)	10.19	0.20	23.89 (81,589)	20.8 (69.5)
70	All	1500 (3200)	12.28	0.27	27.87 (95.181)	20.8 (69.5)
80	All	1700 (3700)	14.66	0.45	30.6 (104,505)	21.4 (70.5)
90	All	2000 (4100)	15.09	0.55	33.0 (112,701)	21.9 (71.5)
100	All	2200 (4600)	15.69	0.60	33.7 (115,092)	23 (73.4)
Return Air Temperature – 40.6°C (105°F)						
30	All	700 (1400)	7.13	0.09	16.6 (56,692)	20.8 (69.5)*
40	All	900 (1800)	9.46	0.28	22.2 (75,817)	20.8 (69.5)
50	All	1100 (2300)	11.77	0.57	27.7 (94,600)	20.8 (69.5)
60	All	1300 (2800)	13.96	0.93	29.6 (101,089)	21.1 (70.0)
70	All	1500 (3200)	14.43	1.00	34.5 (117,824)	23 (73.4)
80	All	1700 (3700)	14.93	1.04	35.6 (121,580)	24.7 (76.5)
90	All	2000 (4100)	15.58	1.25	36.5 (124,654)	79.0 (26.1)
100	All	2200 (4600)	16.17	1.55	37.9 (129,435)	27.1 (80.7)

*In this case, the compressor will cycle because its speed is down to the minimum of 35 Hz.
The minimum fan speed for the InRow mode is 30%; the minimum fan speed for HACS and RACS mode is 40%.
Note: Outdoor temperature is 35°C (95°F)
Note: For ACRD500 series, reduce airflow and cooling capacity specifications by 7% for cooling units run at low input voltage (380 V).

General Data

General Specifications – ACRD200 series

Data	Units	Water Cooled	Glycol Mixture Cooled
Nominal flow rate entering to the unit	l/s (GPM)	0.64 (10.0)	0.64 (10.0)
Design entering temperature	°C (°F)	29.4 (85.0)	40.6 (105.0)
Maximum heat rejection	kW (BTU/hr)	15.2 (52,000)	15.2 (52,000)
Maximum glycol percentage	%	0	40
Entering temperature range for 0.64 l/s (10 GPM) flow rate entering to the unit	°C (°F)	12.8 - 43.3 (55.0 - 110.0)	12.8 - 43.3 (55.0 - 110.0)
Unit pressure drop at 0.64 l/s (10 GPM)	kPa (psi)	33.1 (4.8)	43.4 (6.3)

Fluid-cooled unit performance

MODEL			ACRD200 Series
AIR SYSTEM - FAN (Standard Filter Installed)			
	Size - mm (in)		200 (7.9)
	Air Volume - l/s (SCFM)		1080 (2290)
	Fan Motor - W (HP) each		115 (0.15)
	Number of Fans		6
COOLING COIL - COPPER TUBE/ALUMINUM FIN			
	Face Area - m^2 (ft^2)		0.37 (3.97)
	Rows Deep		2
FILTERS - WASHABLE (STANDARD)			
	Quantity		2
	Size - mm (in)		238 X 933 (9.375 X 36.75)
	Depth - mm (in)		13 (1/2)
	Efficiency (%)		<20% MERV 1
FILTERS - PLEATED (OPTIONAL)			
	Quantity		2
	Size - mm (in)		238 X 933 (9.375 X 36.75)
	Depth - mm (in)		51 (2)
	Efficiency (%)		30% MERV 8
PHYSICAL DATA			
	Weight - kg (lbs)		199.09 (438)
	Height - mm (in)		1991 (78.39)
	Width - mm (in)		300 (11.8)
	Depth - mm (in)		1070 (42.13)
CONNECTION SIZES			
	Liquid	In	7/8-in O DF brazed
		Return	7/8-in ODF brazed
	Condensate Drain	Drain Line - in	3/16-in ID, 5/16-in OD
REFRIGERANT			
	Type		R410A
	Charge - kg (oz)		2.2 (78)

Air-Cooled unit performance

Data		Model	Value
AIR SYSTEM - FAN (Standard Filter Installed)			
	Size - mm (in)	ACRD100 series	200 (7.9)
		ACRD500/ACRP100 series	400 (15.8)
	Air Volume - l/s (SCFM)	ACRD100 series	1080 (2290)
		ACRD500/ACRP100 series	2200 (4600)
	Fan Motor - W (HP) each	ACRD100 series	115 (0.15)
		ACRD500/ACRP100 series	1100 (1.5)
	Number of Fans	ACRD100 series	6
		ACRD500/ACRP100 series	2
COOLING COIL - COPPER TUBE/ALUMINUM FIN			
	Face Area - m^2 (ft^2)	ACRD100 series	0.37 (3.97)
		ACRD500/ACRP100 series	0.56 (6.0)
	Rows Deep	ACRD100 series	2
		ACRD500/ACRP100 series	4
FILTERS - WASHABLE (STANDARD)			
	Quantity	ACRD100 series	2
	Size - mm (in)		238 X 933 (9.375 X 36.75)
	Depth - mm (in)		13 (1/2)
	Efficiency (%)		<20% MERV 1
FILTERS - PLEATED (STANDARD)			
	Quantity	ACRD500/ACRP100 series	3
	Size - mm (in)		418 x 470 (16.45 x 18.5)
	Depth - mm (in)		101.6 (4)
	Efficiency (%)		30
FILTERS - PLEATED (OPTIONAL)			
	Quantity	ACRD100 series	2
	Size - mm (in)		238 X 933 (9.375 X 36.75)
	Depth - mm (in)		51 (2)
	Efficiency (%)		30% MERV 8
FILTERS - PLEATED (OPTIONAL)			
	Quantity	ACRD500/ACRP100 series	3
	Size - mm (in)		418 x 470 (16.45 x 18.5)
	Depth - mm (in)		101.6 (4)
	Efficiency (%)		85

Data		Model	Value
PHYSICAL DATA			
	Weight - kg (lbs)	ACRD100 series	183 (404)
		ACRD500 series	367 (808)
		ACRP100 series	372 (820)
	Height - mm (in)	ACRD100 series	1991 (78.39)
		ACRD500/ACRP100 series	1991 (78.39)
	Width - mm (in)	ACRD100 series	300 (11.8)
		ACRD500/ACRP100 series	600 (23.62)
	Depth - mm (in)	ACRD100 series	1070 (42.13)
		ACRD500/ACRP100 series	1070 (42.13)
CONNECTION SIZES			
	Refrigerant		
	Discharge	ACRD100 series	1/2 in ODF brazed
		ACRD500/ACRP100 series	7/8 in ODF brazed
	Maximum pressure drop - bar (PSI)	ACRD100 series	0.7 (10)
		ACRD500/ACRP100 series	0.7 (10)
	Liquid	ACRD100 series	1/2 in ODF brazed
		ACRD500/ACRP100 series	7/8 in ODF brazed
	Condensate Drain		
	Drain Line - in	ACRD100 series	3/16-in ID, 5/16-in OD
		ACRD500/ACRP100 series	1/2
	Humidifier		
	Supply Line – mm (in)	ACRD100 series	6.35 (1/4)
REFRIGERANT			
	Type	ACRP100 series	R410A (amount determined at installation)
		ACRD500/ACRP100 series	R407C (amount determined at installation)
HUMIDIFICATION – SOLID STATE ELECTRODE CANISTER			
	Flush Cycle	ACRP100 series	Automatic
	Capacity – kg/hr (lbs/hr)	ACRP100 series	3.0 (6.6)
	kW	ACRP100 series	2.25
REHEAT – ELECTRIC (Equally Loaded Three Stage, Finned Tubular, Low-Watt Density)			
	Capacity – kW (BTU/hr)	ACRP100 series	9.0 (30,700)
	Stages	ACRP100 series	3

Altitude correction factors

Room Condition: 72 DB/50% RH											
Altitude – m (ft)	0	305 (1000)	610 (2000)	915 (3000)	1219 (4000)	1524 (5000)	1829 (6000)	2134 (7000)	2438 (8000)	2743 (9000)	3048 (10000)
Specific volume – cm^3/g (ft^3/lb)	847.77 (13.58)	879.61 (14.09)	912.70 (14.62)	947.66 (15.18)	983.86 (15.76)	1021.32 (16.36)	1061.28 (17.00)	1103.10 (17.67	1146.80 (18.37)	1193.00 (19.11)	1241.69 (19.89)
Density – g/m^3 (lb/ft^3)	1185.37 (0.074)	1137.31 (0.071)	1089.26 (0.068)	1057.22 (0.066)	1009.16 (0.063)	977.13 (0.061)	945.10 (0.059)	913.05 (0.057)	865.00 (0.054)	832.97 (0.052)	800.92 (0.050)
Density Ratio*	1.000	0.964	0.929	0.895	0.862	0.830	0.799	0.769	0.739	0.711	0.683
Capacity Correction**	1.000	0.981	0.962	0.933	0.913	0.884	0.865	0.846	0.826	0.807	0.787

*Density ratio is used for air flow correction factor.
**Capacity correction is used to derate performance.

Sound performance data

ACRD100 and ACRD200 Series Tested Sound Data

Fan Speed %	Fan RPM	Airflow m^3/s (SCFM)	Sound Power dB at Frequency Hz re: $10^{-12}W$								Lp Sound Pressure dB re: 20 µPa*
			125	250	500	1000	2000	4000	8000	dBA**	dBA
60	2300	0.66 (1400)	62.3	68.3	69.8	74.8	67.8	59.3	53.3	76.5	70.5
70	3000	0.78 (1650)	65.3	76.3	74.8	77.8	73.8	67.8	61.3	80.8	74.7
80	3450	0.85 (1800)	67.3	80.3	77.3	78.2	76.3	71.8	66.3	82.7	76.6
90	3800	0.92 (1950)	68.3	81.8	78.8	80.8	77.3	74.3	68.3	84.5	78.4
100	4300	1.08 (2290)	70.3	80.8	83.3	85.3	80.3	77.8	72.3	88.3	82.2

*Weighted Sound Pressure dBA in a 28.3 m^3 (1000 ft^3) room at 1.5 m (5-ft) distance.
**Based on compressor operating at full speed.

ACRD500/ACRP100 Series Air-cooled Tested Sound Data

Fan Speed%	Airflow m^3/s (SCFM)	Sound Power dB at Frequency Hz re: $10^{-12}W$								Lp Sound Pressure dB re: 20 µPa*
		125	250	500	1000	2000	4000	8000	dBA**	dBA
50	1.27 (2700)	84.5	87.5	78.0	77.5	75.0	66.5	65.5	83.4	72.8
75	1.79 (3800)	92.5	90.0	84.0	81.5	77.5	71.5	68.5	87.6	76.8
100	2.36 (5000)	90.0	98.0	91.0	85.0	81.0	76.5	72.0	92.3	82.8

*Weighted Sound Pressure dBA in an 8200 ft^3 (232.2 m^3) room at 6 ft (1.8 m) distance.
**Based on compressor operating at full speed.

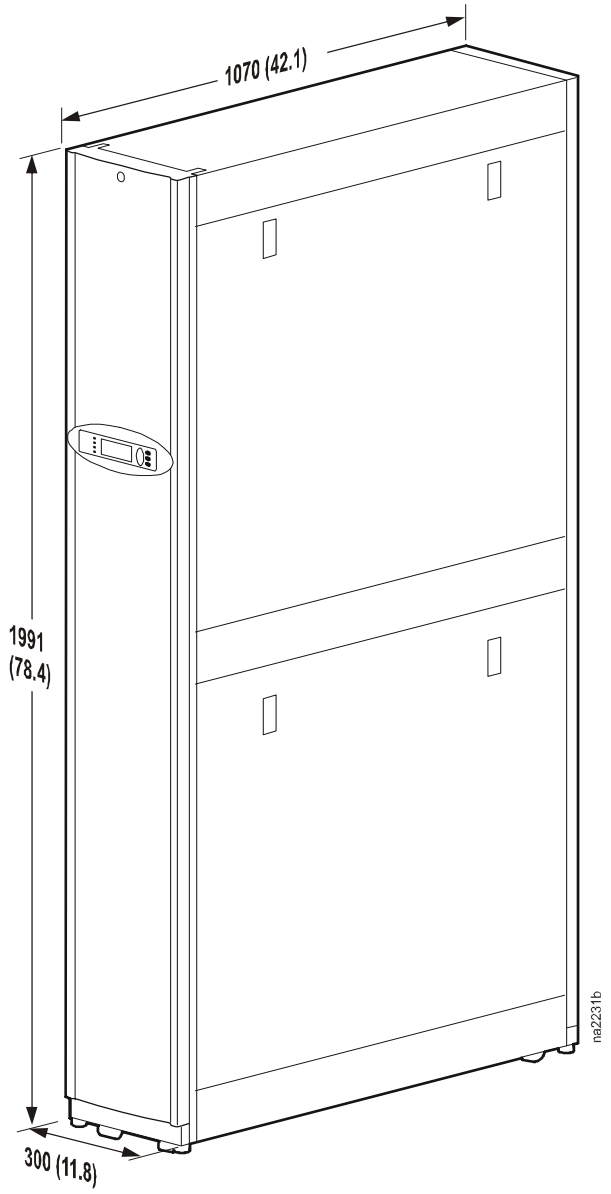
Electrical Data

Model	MCA**	MOP**	FLA**	Compressor		Power
				LRA	RLA	
ACRD100 – 208-240V, 1 Ph, 60Hz	25	40	N/A	87.5	16.0	4.6
ACRD101 – 220-240V, 1 Ph, 50Hz	N/A	N/A	21	97.0	16.3	4.4
ACRD200 - 208-240V, 1 Ph, 60Hz	25	40	N/A	87.5	16.0	4.6
ACRD201 – 220-240V, 1 Ph, 50Hz	N/A	N/A	21	97.0	16.3	4.4
ACRD500 – 200-240V, 3 Ph, 50/60Hz	54.0	90	N/A	160*	50	15
ACRD501 – 460-480V, 3 Ph, 60Hz	27.0	40	N/A	139*	23.2	16
ACRD502 – 380-415V, 3 Ph, 50Hz	N/A	N/A	26.0	139*	23.2	16
ACRP100 – 200-240V, 3 Ph, 50/60Hz	80.1	100	N/A	160*	50	19
ACRP101 – 460-480V, 3 Ph, 60 Hz	39.9	50	N/A	139*	23.2	21
ACRP102– 380-415V, 3 Ph, 50/60Hz	N/A	N/A	32	139*	23.2	20

Note: Above data is based on maximum operating condition
Note: Installation must comply with national and/or local electrical codes.
Note: All models are hard-wired.
Note: Use LRA for estimation of inrush current.
* The compressor is powered by the VFD.
**Cells marked N/A indicate that this information is not required because of regional differences in electrical codes.
MCA—Minimum Circuit Amperes
MOP—Maximum Overcurrent Protection
FLA—Full Load Amps
LRA—Compressor Locked Rotor Amps
RLA—Compressor Rated Load Amps.

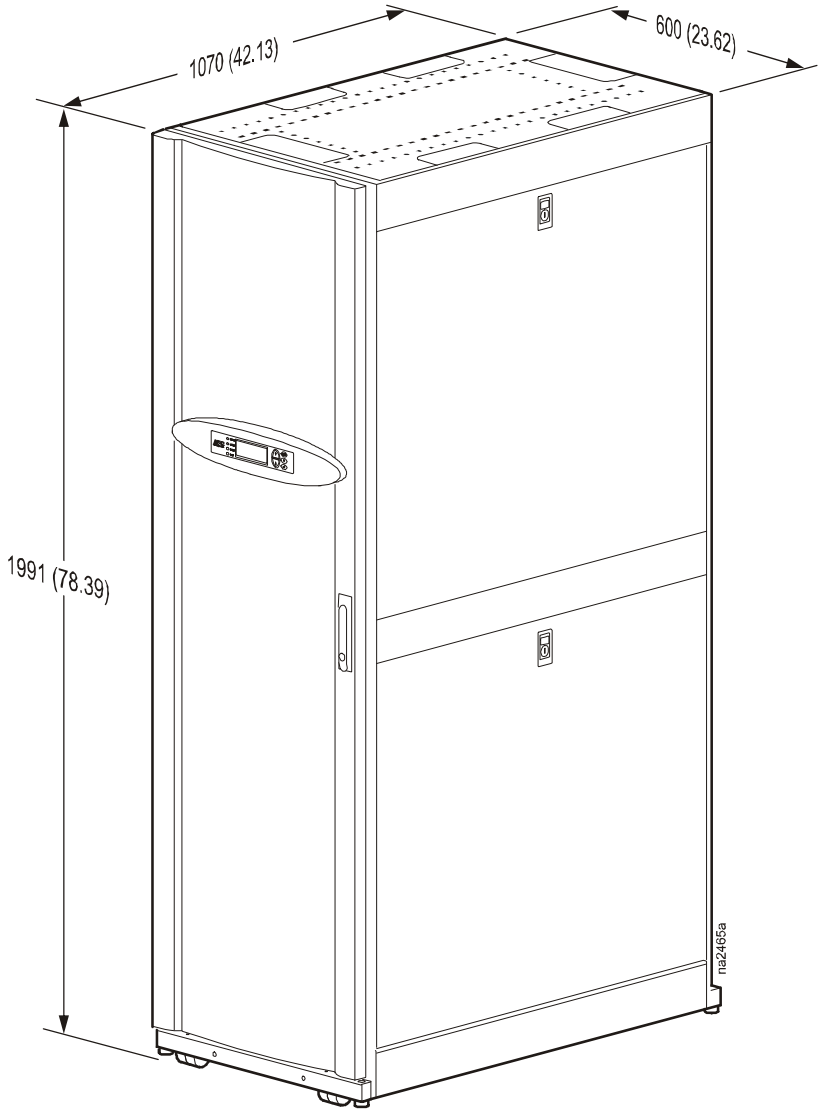
Dimensional Data

ACRD100/ACRD200 series



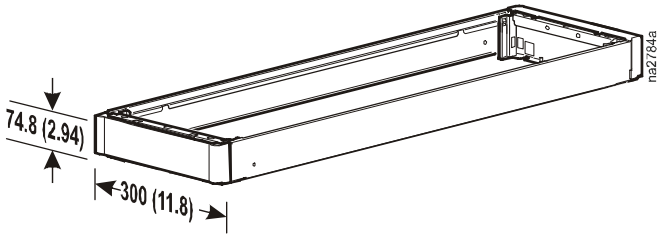
Dimensions are shown in mm (in).

ACRD500/ACRP100 series

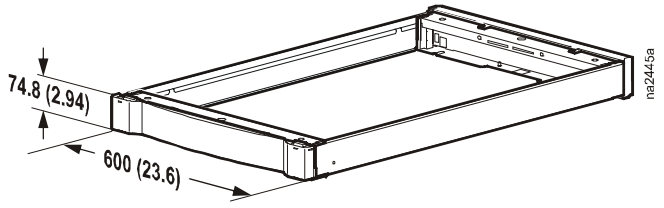


Dimensions are shown in mm (in).

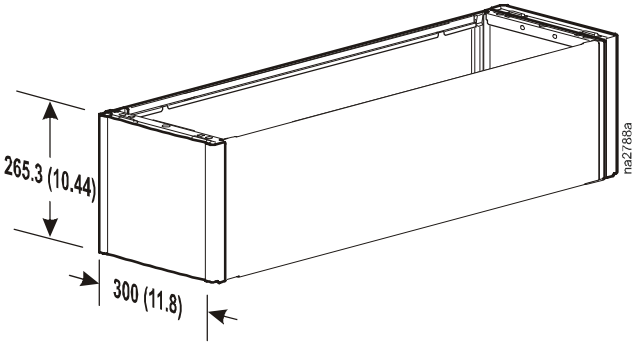
NetShelter SX to VX Height Adapter: ACRD100/ACRD200 series



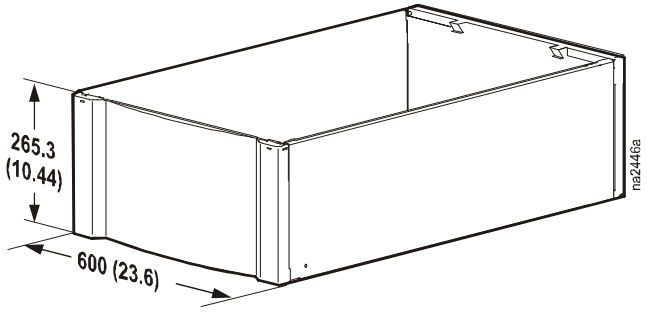
NetShelter SX to VX Height Adapter: ACRD500/ACRP100 series



NetShelter SX to 48-U SX Height Adapter: ACRD100/ACRD200 series



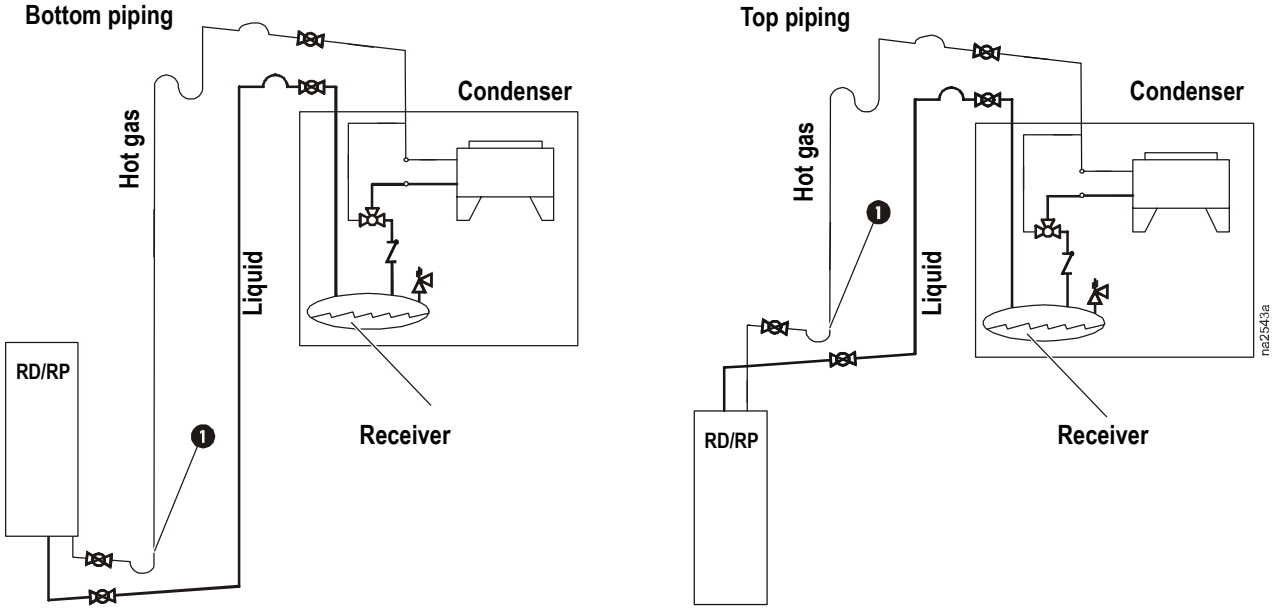
NetShelter SX to 48-U SX Height Adapter: ACRD500/ACRP100 series



Dimensions are shown in mm (in).

Piping and Mechanical Connections

Refrigeration piping diagram (ACRD100/ACRD500/ACRP100 series))



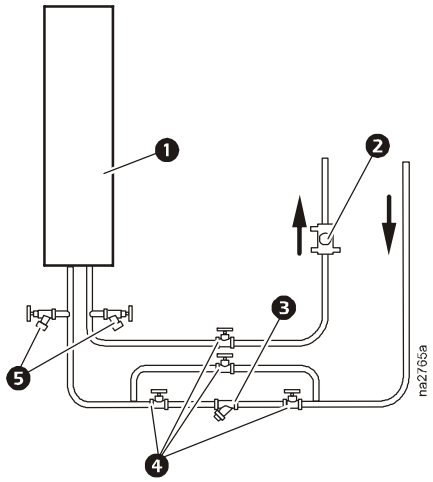
Note: Shutoff valves shown nearest to the condensers **are not** supplied by APC by Schneider Electric.
ACRD500/ACRP100 series: The shutoff valves nearest to the cooling unit **are** supplied by APC by Schneider Electric.
ACRD100 series: The shutoff valves **are not** supplied and must be ordered.

❶	Pitch in direction of refrigerant flow; 4 mm per m (1/2 in per 10 ft)		P-trap
	Shutoff valves		S-trap
	Head pressure control valve		Inverted P-trap
	Check valve		Pressure relief valve

- Route piping through the top or bottom of the InRow ACRD/ACRP series.
- All lines are Type L ACR copper tubing.
- Trap the vertical discharge line every 6 m (20 ft) to ensure proper oil return.
- Pipe size should change after the P-trap based on the recommended piping charts provided with the installation manual.
- For the ACRD500/ACRP100 series, the maximum piping run is 61 m (200 ft) equivalent length. Size the piping pursuant to accepted refrigeration practice.
- Fore the ACRD100 series, piping is 46m (150 ft) equivalent length. Size the piping pursuant to accepted refrigeration practices.

Warning: Do not install the air-cooled condenser below the InRow ACRD/ACRP series. The condenser must be positioned above or at the same level as the InRow ACRD/ACRP series to ensure proper function.

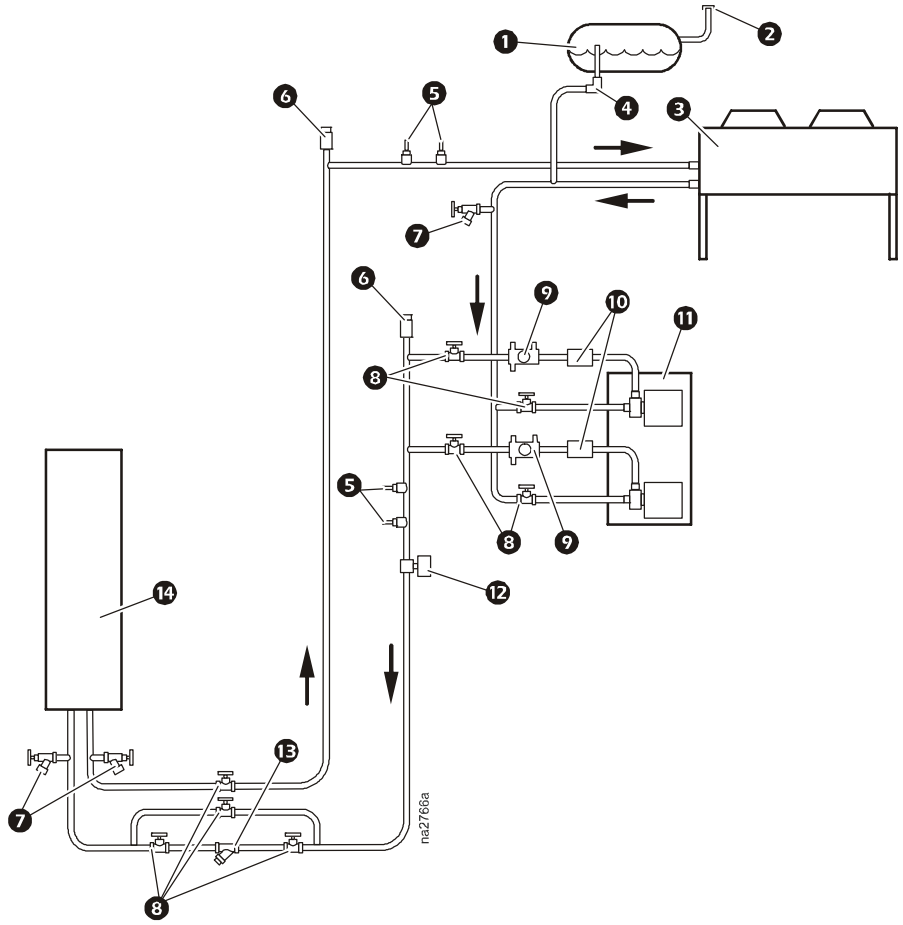
Water-cooled piping–bottom piping (ACRD200 series)



❶	InRow DX	❹	Gate valve*
❷	Balancing valve*	❺	Hose bib*
❸	Strainer, 20 mesh*		

*Field supplied and installed

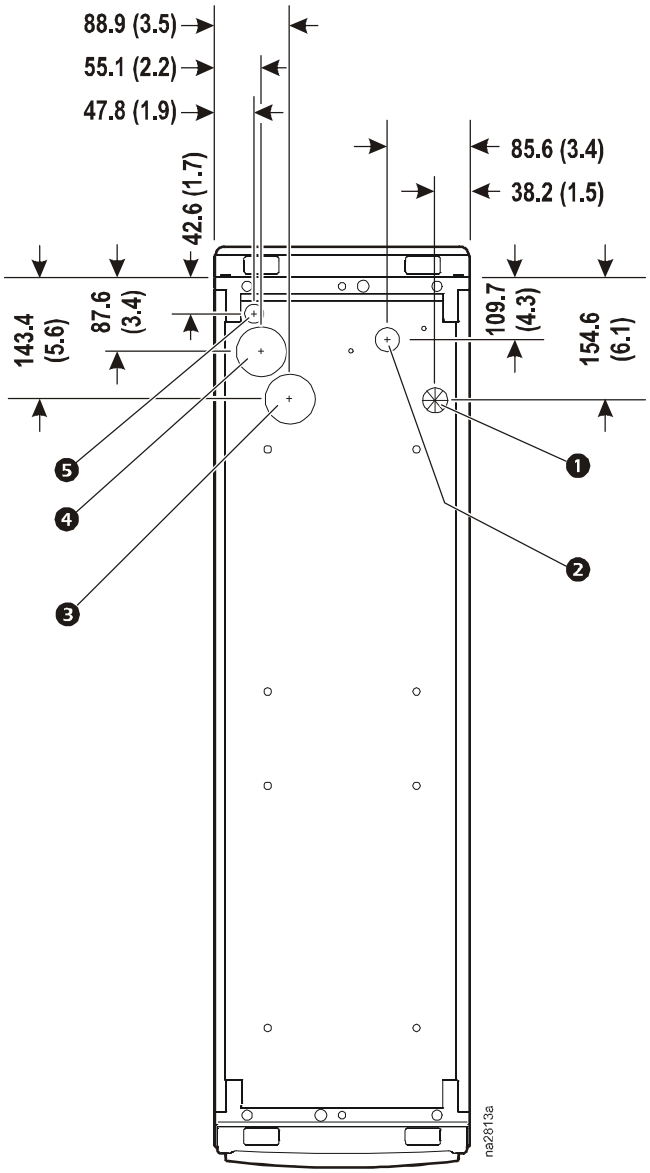
Glycol-cooled bottom piping (ACRD200 series)



❶	Expansion tank*	❽	Gate valves*
❷	Tank fill*	❾	Balancing valve*
❸	Fluid-cooler	❿	Check valve
❹	Airtrol fitting*	⓫	Pump package*
❺	Temperature and pressure gauges*	⓬	Flow switch
❻	Air vent*	⓭	Strainer, 20 mesh*
❼	Hose bibs*	⓮	InRow RD

*Field supplied and installed

Top piping and power access locations (ACRD100/ACRD200 series)



Dimensions are shown in mm (in).

❶ Low voltage wiring input

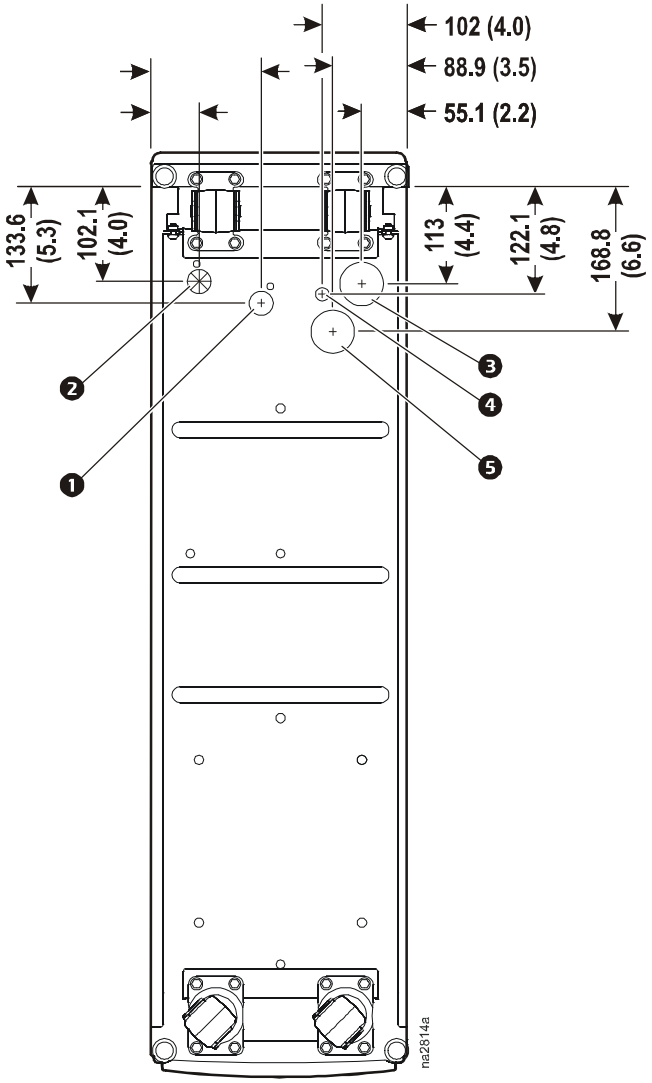
❷ Electrical input

❸ Hot gas discharge line (ACRD100 series)
Water/glycol out (ACRD200 series)

❹ Liquid line (ACRD100 series)
Water/glycol in (ACRD200 series)

❺ Condensate pump outlet

Bottom piping and power access locations–looking up (ACRD100/ACRD200 series)



Dimensions are shown in mm (in).

❶ Electrical input

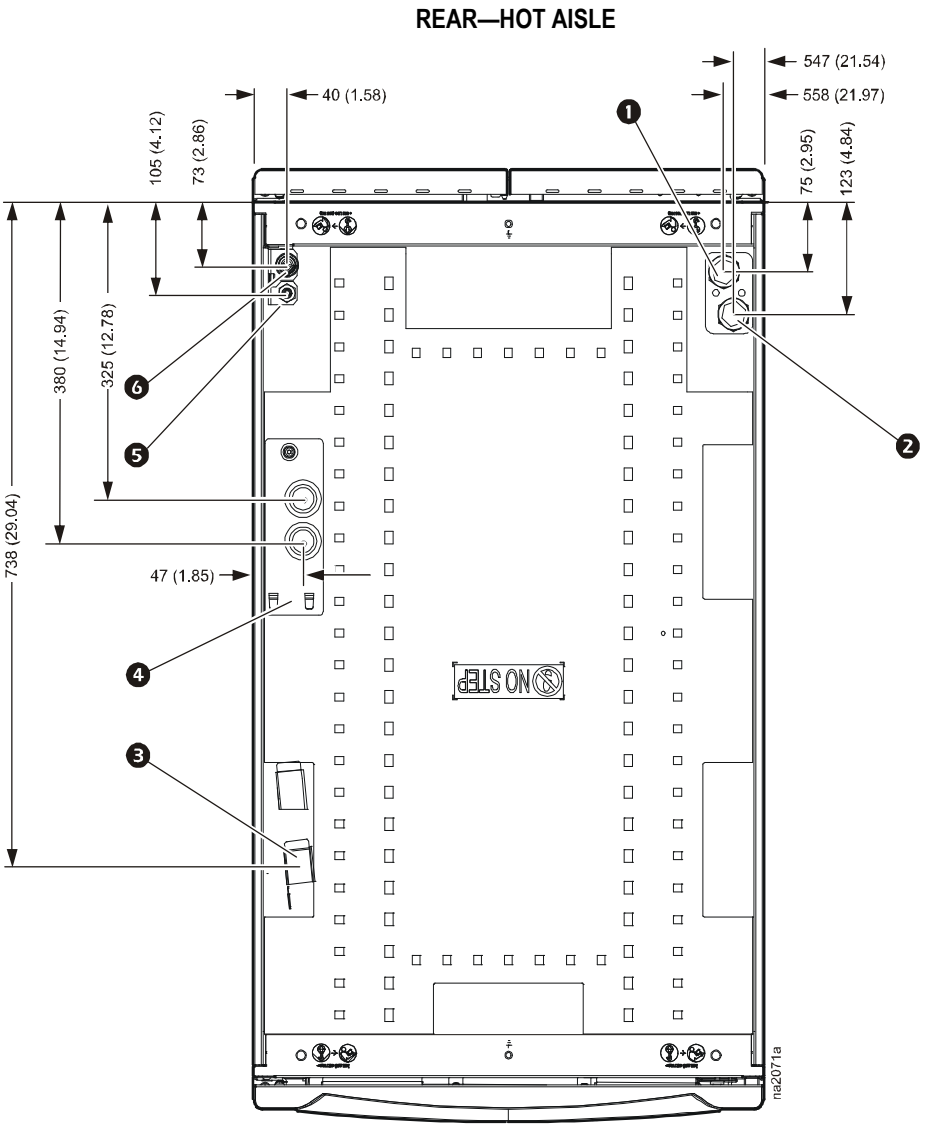
❷ Low voltage wiring input

❸ Liquid line (ACRD100 series)
Water/glycol in (ACRD200 series)

❹ Condensate pump outlet

❺ Hot discharge gas line (ACRD100 series)
Water/glycol out (ACRD200 series)

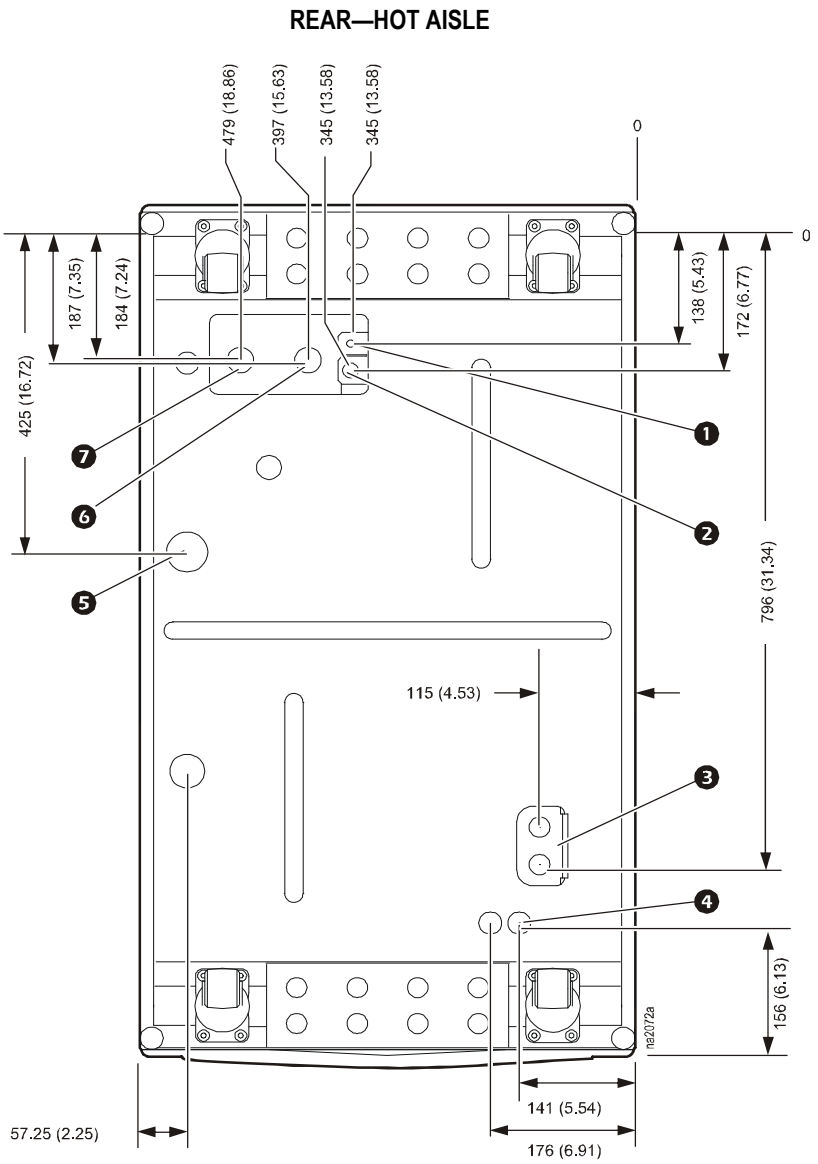
Air-cooled piping access–top view, looking down (ACRD500/ACRP100 series)



1. Refrigerant discharge line
2. Refrigerant liquid line
3. Trough for communication cables
4. Power connections
5. Humidifier water supply (ACRP100 only)
6. Condensate drain

Note: Dimensions are shown in mm (in).

Air-cooled piping access – bottom view, looking up (ACRD500/ACRP100 series)



1. Humidifier water supply (ACRP100 series)
2. Condensate drain
3. Power connections
4. Communication connections
5. Condensate overflow
6. Refrigerant discharge line
7. Refrigerant liquid line

Note: Dimensions are shown in mm (in).

Outdoor Heat Exchangers

Air-cooled condensers – mechanical Data (ACRD100 series)

Model	Ambient Temp °C (°F)	Sound Pressure *	Air Quantity	Fan	Unit	Connection Size		Weight	Capacity	
			l/s (CFM)	Qty.	kW	Hot Gas	Liquid	Kg (lbs)	MBH/1F TD	kW/1C TD
ACCD75214	35 (95) / 40 (104)	65	2380 (5050)	1	1.1	1 1/8 in	7/8 in	82 (180)	2.43	1.28
ACCD75215	46 (115)	66	3040 (6450)	1	1.1	1 1/8 in	7/8 in	118 (260)	4.00	2.11
ACCD75216	35 (95) / 40 (104)	59	2140 (4530)	1	0.8	22 mm	18 mm	48 (105.8)	2.35	1.24
ACCD75217	46 (115)	62	4280 (9060)	2	1.6	28 mm	22 mm	89 (196.2)	4.30	2.27
ACCD75218	35 (95) / 40 (104)	59	2140 (4530)	1	0.6	22 mm	18 mm	48 (105.8)	2.35	1.24
ACCD75219	46 (115)	62	4280 (9060)	2	1.3	28 mm	22 mm	89 (196.2)	4.30	2.27
ACCD75220 **	35 (95) / 40 (104)	59	2140 (4530)	1	0.6	22 mm	18 mm	48 (105.8)	2.35	1.24

* (dbA) at 10 ft and 100% Fan Speed
** ACCD75220 is CCC certified for use in China.

Air-cooled condensers mechanical data (ACRD500/ACRP100 series)

Model	Ambient Temp °C (°F)	Sound Pressure *	Sound Pressure **	Air Quantity	Fan	Unit	Connection Size (inches)		Weight	Capacity	
				l/s (CFM)	Qty.	kW	Hot Gas	Liquid	Kg (lbs)	MBH/1F TD	kW/1C TD
ACCD75201	95 (35)	67	62	4955 (10500)	1	2.2	1 3/8	1 3/8	163 (360)	8.8	4.6
ACCD75202	105 (40)	70	65	10383 (22000)	2	4.4	1 5/8	1 5/8	290 (640)	14.6	7.7
ACCD75203	115 (46)	72	68	14819 (31400)	3	6.6	2 1/8	2 1/8	458 (1010)	25.8	13.6
ACCD75204	95 (35)	67	62	4955 (10500)	1	2.2	1 3/8	1 3/8	163 (360)	8.8	4.6
ACCD75205	105 (40)	70	65	10383 (22000)	2	4.4	1 5/8	1 5/8	290 (640)	14.6	7.7
ACCD75206	115 (46)	72	68	14819 (31400)	3	6.6	2 1/8	2 1/8	458 (1010)	25.8	13.6
ACCD75207	95 (35)	54	51	5711 (12100)	1	2.2	42	22	173 (381)	17.6	9.3
ACCD75208	105 (40)	57	54	11940 (25300)	2	4.4	42	28	307 (677)	27.1	14.3
ACCD75209	115 (46)	57	55	11374 (24100)	2	4.4	54	35	360 (792)	48.2	25.4

* (dbA) at 10 ft and 100% Fan Speed
** (dbA) at 10 ft set area level, and Max Compressor Speed Selected Ambient Temp
Specifications given for conditions at sea level.

Fluid coolers – mechanical data (ACRD200 Series)

Model	Ambient Temp °C (°F)	Sound Pressure *	Air Quantity	Fan	Unit	Connection Size (inches)	Weight	Capacity	
			l/s (CFM)	Qty.	kW		Kg (lbs)	MBH/1F TD	kW/1C TD
ACFC75210	40 (105)	68	4760 (10100)	2	2.0	1 3/8	205 (450)	3.20	1.69
ACFC75255	35 (95)	65	2380 (5050)	1	1.0	1 1/8	150 (330)	2.36	1.24
ACFC75256	35 (95)	62	4220 (8950)	2	1.6	1 1/2	90 (198)	2.50	1.32
ACFC75257	40 (105)	56	5500 (11650)	2	1.4	2	151 (333)	3.30	1.74

* (dbA) at 10 ft and 100% Fan Speed

Air-cooled condensers – electrical data (ACRD100 series)

Model	Voltage Phase Frequency	Receiver Model	Receiver Qty	FLA***	MCA***	MOP***
ACCD75214	208-240V, 1 ph, 60 Hz	ACAC75009	1	4.8	15	15
ACCD75215	208-240V, 1 ph, 60 Hz	ACAC75009	2	4.8	15	15
ACCD75216	380-415V, 3 ph, 50 Hz	ACAC75009	1	1.35	N/A	N/A
ACCD75217	380-415V, 3 ph, 50 Hz	ACAC75009	1	2.7	N/A	N/A
ACCD75218	220-240V, 1 ph, 50 Hz	ACAC75009	1	3.0	N/A	N/A
ACCD75219	220-240V, 1 ph, 50 Hz	ACAC75009	1	6.0	N/A	N/A
ACCD75220*	220-240V, 1 ph, 50 Hz	ACAC75009	1	3.0	N/A	N/A

*ACCD75220 is CCC certified for use in China.
**Receiver model is ACAC75009
***Cells marked N/A indicate that this information is not required because of regional differences in electrical codes.
FLA—Full Load Amps
MCA—Minimum Circuit Ampacity
MOP—Maximum Overcurrent Protection

Air-cooled condensers - electrical data (ACRD500/ACRP100 series)

Model	Voltage Phase Frequency	Receiver Model	Receiver Qty	FLA*	MCA*	MOP*
ACCD75201	200–240V 3 ph 60 Hz	ACAC75004	1	7.0	15.0	25
ACCD75202	200–240V 3 ph 60 Hz	ACAC75005	1	14.0	20.0	35
ACCD75203	200–240V 3 ph 60 Hz	ACAC75007	1	21.0	22.8	40
ACCD75204	460–480V 3 ph 60 Hz	ACAC75004	1	3.5	15.0	15
ACCD75205	460–480V 3 ph 60 Hz	ACAC75005	1	7.0	15.0	15
ACCD75206	460–480V 3 ph 60 Hz	ACAC75007	1	10.5	15.0	20
ACCD75207	380–415V 3 ph 50 Hz	Included with condenser	1	2.85	N/A	N/A
ACCD75208	380–415V 3 ph 50 Hz	Included with condenser	1	5.7	N/A	N/A
ACCD75209	380–415V 3 ph 50 Hz	Included with condenser	1	5.7	N/A	N/A

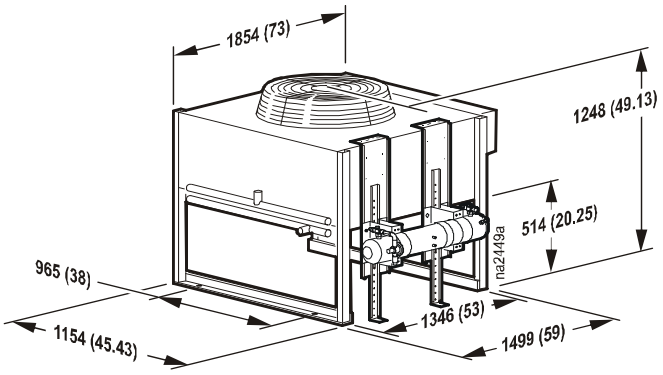
*Cells marked N/A indicate that this information is not required because of regional differences in electrical codes.
FLA—Full Load Amps
MCA—Minimum Circuit Amperes
MOP—Maximum Overcurrent Protection

Fluid coolers - electrical data (ACRD200 series)

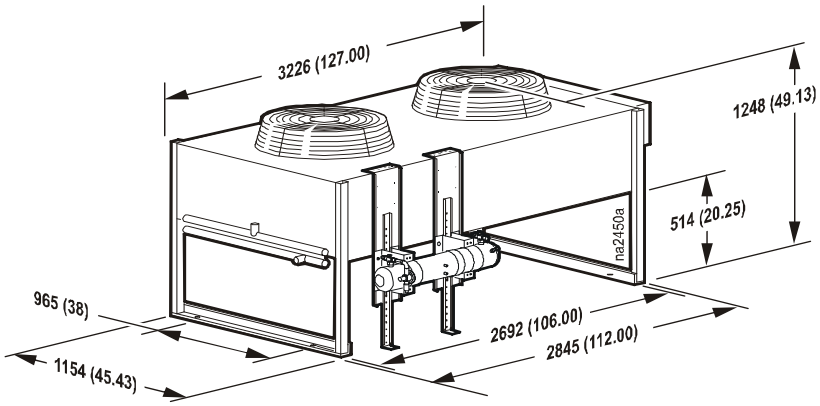
Model	Voltage Phase Frequency	FLA*	MCA*	MOP*
ACFC75210	460V 3 ph 60 Hz	2.6	15	15
ACFC75255	480V 3 ph 60 Hz	1.3	15	15
ACFC75256	380-415V 3 ph 50 Hz	2.7	N/A	N/A
ACFC75257	380-415V 3 ph 50 Hz	2.7	N/A	N/A

*Cells marked N/A indicate that this information is not required because of regional differences in electrical codes.
FLA—Full Load Amps
MCA—Minimum Circuit Ampacity
MOP—Maximum Overcurrent Protection

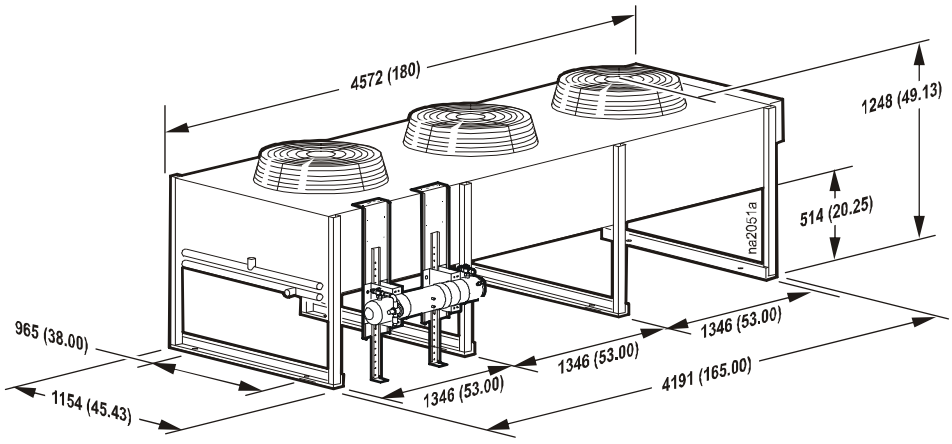
ACCD75201 and ACCD75204



ACCD75202 and ACCD75205



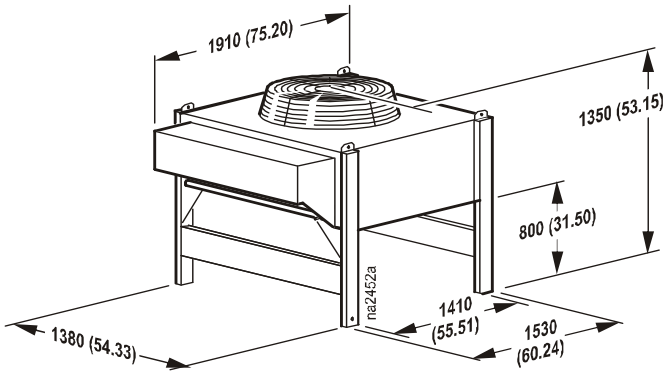
ACCD75203 and ACCD75206



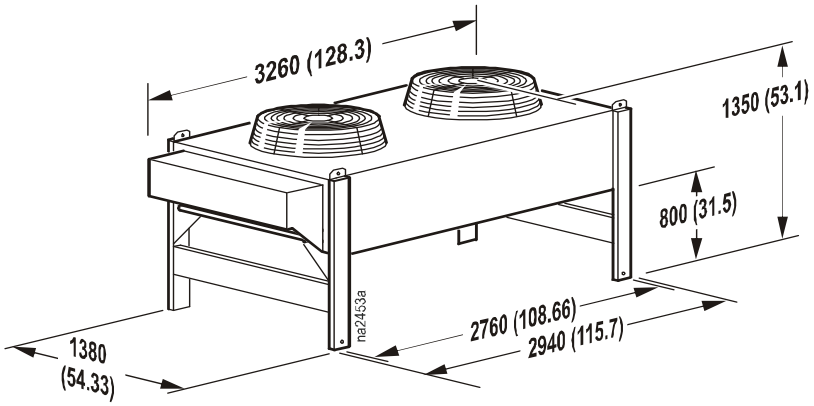
Dimensions are shown in mm (in).

Note: Condensers shown above have eight 22 mm (0.875 in) mounting holes on their lower rails.

ACCD75207

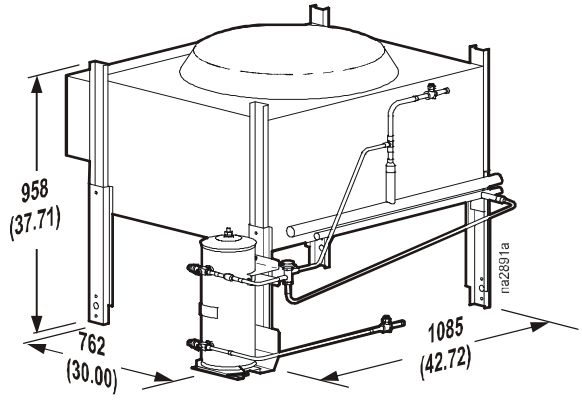


ACCD75208 and ACCD75209

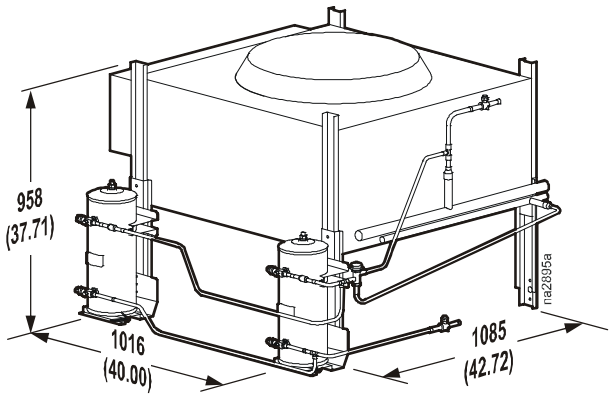


Condensers shown above have 16 mm (0.63 in) mounting holes on each of their lower legs.

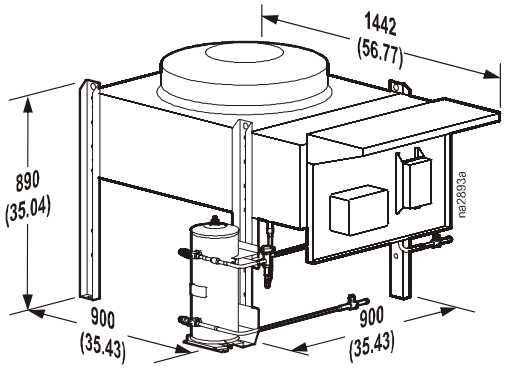
ACCD75214



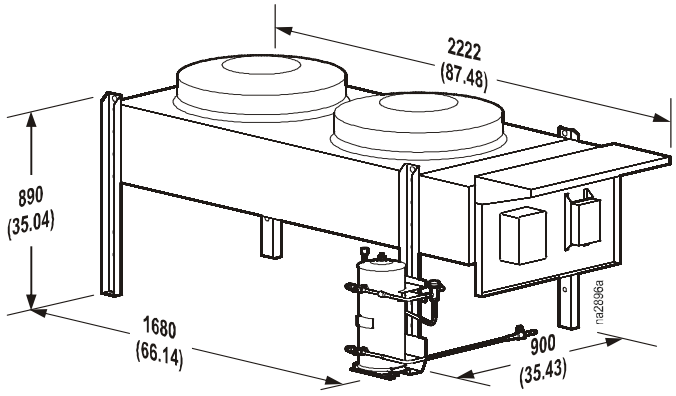
ACCD75215



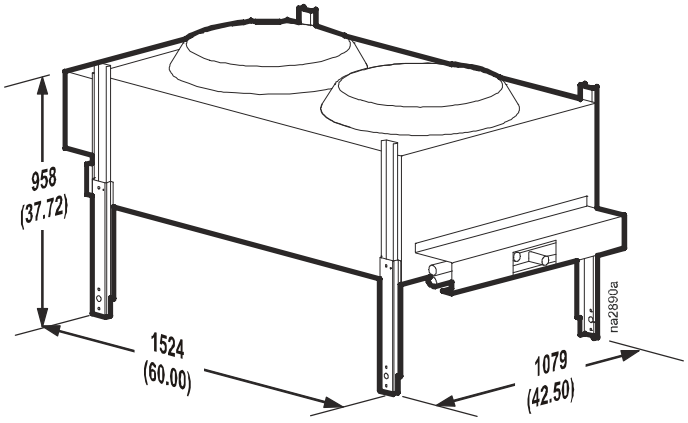
ACCD75216, ACCD75218, and ACCD75220



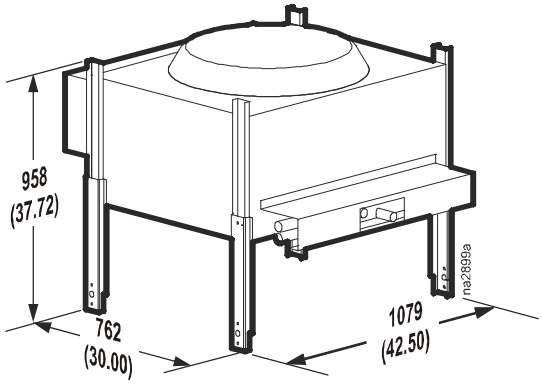
ACCD75217 and ACCD75219



ACFC75210

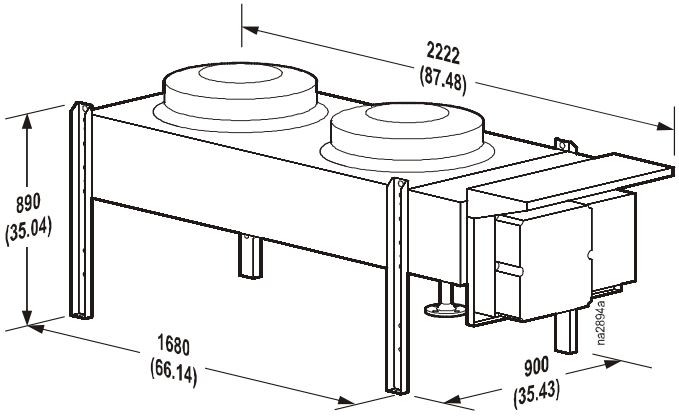


ACFC75255

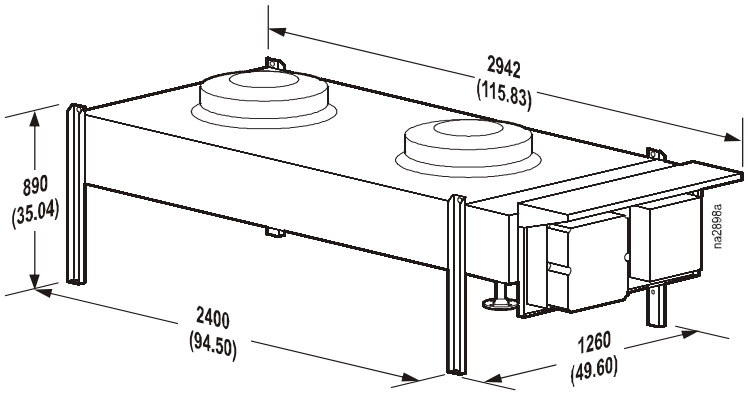


Dimensions are shown in mm (in).

ACFC75256



ACFC75257



Dimensions are shown in mm (in).

Facility Planning

	Air-Cooled					Fluid-Cooled	
Model	**ACRD100**	**ACRD101**	**ACRD500/ ACRP100**	**ACRD501 ACRP101**	**ACRD502 ACRP102**	**ACRD200**	**ACRD201**
Input Voltage	208–230	220–240	460–480	460–480	380–415	208–230	220–240
Phases	1	1	3	3	3	1	1
Frequency	60	50	50/60	60	50/60	60	50
Total NET Capacity – kW (BTU/hr)	9.9 (33800)	9.69 (33100)	29 (99000)	29 (99000)	29 (99000)	9.9 (33800) 10.92 (37300)*	9.69 (33100) 10.98 (37500)*
Sensible NET Capacity – kW (BTU/hr)	9.9 (33800)	9.69 (33100)	29 (99000)	29 (99000)	29 (99000)	9.9 (33800) 10.92 (37300)*	9.69 (33100) 10.98 (37500)*
Cabinet Width mm (in)	300 (11.81)	300 (11.81)	600 (23.62)	600 (23.62)	600 (23.62)	300 (11.81)	300 (11.81)
Net Weight – kg (lbs)	183 (404)	183 (404)	367 (808)/ 378 (833)	367 (808)/ 378 (833)	367 (808)/ 378 (833)	199 (438)	199 (438)
Operating Weight – kg (lbs)	183 (404)	183 (404)	367 (808)/ 378 (833)	367 (808)/ 378 (833)	367 (808)/ 378 (833)	199 (438)	199 (438)
Cabinet Height – mm (in)	1991 (78.9)	1991 (78.9)	1991 (78.9)	1991 (78.9)	1991 (78.9)	1991 (78.9)	1991 (78.9)
Cabinet Depth – mm (in)	1070 (42.13)	1070 (42.13)	1070 (42.13)	1070 (42.13)	1070 (42.13)	1070 (42.13)	1070 (42.13)
Power Connection Type	Hard-wired	Hard-wired	Hard-wired	Hard-wired	Hard-wired	Hard-wired	Hard-wired
Full Load Amps**	N/A	21.0	N/A	N/A	26.0/32.0	N/A	21.0
Minimum Circuit Ampacity**	25.0	N/A	54/80.1	27/39.9	N/A	25.0	N/A
Maximum Overcurrent Protection**	40.0	N/A	90/100	40.0/50.0	N/A	40.0	N/A
Power Connection Quantity	1	1	1	1	1	1	1
Features/Options:							
Fan Type	DC Axial	DC Axial	BI ECM	BI ECM	BI ECM	DC Axial	DC Axial
Maximum Airflow – l/s (CFM)	1080 (2290)	1080 (2290)	2171 (4600)	2171 (4600)	2171 (4600)	1080 (2290)	1080 (2290)
Fan Control	Variable Speed	Variable Speed	Variable Speed	Variable Speed	Variable Speed	Variable Speed	Variable Speed
Fan Quantity	6	6	2	2	2	6	6
Hot Swappable Fans	Yes	Yes	No	No	No	Yes	Yes
Hot Aisle Containment Compatible	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rack Air Containment Compatible	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Refrigerant Type	R410A	R410A	R407C	R407C	R407C	R410A	R410A
Compressor Type	Scroll	Scroll	Reciprocating	Reciprocating	Reciprocating	Scroll	Scroll
Compressor Capacity Control Type	Hot Gas Bypass	Hot Gas Bypass	VFD	VFD	VFD	Hot Gas Bypass	Hot Gas Bypass
Condenser/Glycol Control Valve	N/A	N/A	N/A	N/A	N/A	2-way/3-way	2-way/3-way
Network Management Card	Included	Included	Included	Included	Included	Included	Included
Standard Filter Type	1/2-in washable	1/2-in washable	4-in pleated	4-in pleated	4-in pleated	1/2-in washable	1/2-in washable
Standard Filter Efficiency	<20%	<20%	30%	30%	30%	<20%	<20%
Optional Filter Type	2-in pleated	2-in pleated	4-in pleated	4-in pleated	4-in pleated	2-in pleated	2-in pleated
Optional Filter Efficiency	30%	30%	85%	85%	85%	30%	30%
Condensate Pump	Included	Included	Included	Included	Included	Included	Included
Humidifier Type	N/A	N/A	Steam Canister	Steam Canister	Steam Canister	N/A	N/A
Reheat Type	N/A	N/A	S/S Finned Tubular	S/S Finned Tubular	S/S Finned Tubular	N/A	N/A
Rack Inlet T/H Sensor Quantity	1	1	3	3	3	1	1

	Air-Cooled					Fluid-Cooled	
Model	**ACRD100**	**ACRD101**	**ACRD500/ ACRP100**	**ACRD501 ACRP101**	**ACRD502 ACRP102**	**ACRD200**	**ACRD201**
Piping Connections	Top or Bottom	Top or Bottom	Top or Bottom	Top or Bottom	Top or Bottom	Top or Bottom	Top or Bottom
Electrical Connections	Top or Bottom	Top or Bottom	Top or Bottom	Top or Bottom	Top or Bottom	Top or Bottom	Top or Bottom
Cable Type Water Detector	Optional	Optional	Optional	Optional	Optional	Optional	Optional

Capacity rated at the following conditions:
Entering Air Conditions: 85°F DB / 64.5°F WB (29.4°C DB/ 18.1°C WB)
*Higher rating reflects:
Water-Cooled capacity (i.e. Cooling Tower application) vs. Glycol-Cooled capacity (i.e. Drycooler application)
**Cells marked N/A indicate that this information is not required because of regional differences in electrical codes.

Warranty

Three-Phase Power Products or Cooling Solutions One-Year Factory Warranty

The limited warranty provided by American Power Conversion (APC™) in this Statement of Limited Factory Warranty applies only to products you purchase for your commercial or industrial use in the ordinary course of your business.

Terms of warranty

APC warrants that the product shall be free from defects in materials and workmanship for a period of one year from the date of product start-up when start-up is performed by APC authorized service personnel and occurs within six months of the APC shipment date. This warranty covers repairing or replacing any defective parts including on-site labor and travel. In the event that the product fails to meet the foregoing warranty criteria, the warranty covers repairing or replacing defective parts at the sole discretion of APC for a period of one year from the shipment date. For APC cooling solutions, this warranty does not cover circuit breaker resetting, loss of refrigerant, consumables, or preventive maintenance items. Repair or replacement of a defective product or part thereof does not extend the original warranty period. Any parts furnished under this warranty may be new or factory-remanufactured.

Non-transferable warranty

This warranty is extended to the first person, firm, association or corporation (herein referred to by "You" or "Your") for whom the APC product specified herein has been purchased. This warranty is not transferable or assignable without the prior written permission of APC.

Assignment of warranties

APC will assign you any warranties which are made by manufacturers and suppliers of components of the APC product and which are assignable. Any such warranties are assigned "AS IS" and APC makes no representation as to the effectiveness or extent of such warranties, assumes no responsibility for any matters which may be warranted by such manufacturers or suppliers and extends no coverage under this Warranty to such components.

Drawings and descriptions

APC warrants for the warranty period and on the terms of the warranty set forth herein that the APC product will substantially conform to the descriptions contained in the APC Official Published Specifications or any of the drawings certified and agreed to by contract with APC if applicable thereto ("Specifications"). It is understood that the specifications are not warranties of performance and not warranties of fitness for a particular purpose.

Exclusions

APC shall not be liable under the warranty if its testing and examination disclose that the alleged defect in the product does not exist or was caused by end user or any third person's misuse, negligence, improper installation or testing. Further, APC shall not be liable under the warranty for unauthorized attempts to repair or modify wrong or inadequate electrical voltage or connection, inappropriate on-site operation conditions, corrosive atmosphere, repair, installation, start-up by non-APC designated personnel, a change in location or operating use, exposure to the elements, Acts of God, fire, theft, or installation contrary to APC recommendations or specifications or in any event if the APC serial number has been altered, defaced, or removed, or any other cause beyond the range of the intended use.

THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, BY OPERATION OF LAW OR OTHERWISE, OF PRODUCTS SOLD, SERVICED OR FURNISHED UNDER THIS AGREEMENT OR IN CONNECTION HEREWITH. APC DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY, SATISFACTION AND FITNESS FOR A PARTICULAR PURPOSE. APC EXPRESS WARRANTIES WILL NOT BE ENLARGED, DIMINISHED, OR AFFECTED BY AND NO OBLIGATION OR LIABILITY WILL ARISE OUT OF, APC RENDERING OF TECHNICAL OR OTHER ADVICE OR SERVICE IN CONNECTION WITH THE PRODUCTS. THE FOREGOING WARRANTIES AND REMEDIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES AND REMEDIES. THE WARRANTIES SET FORTH ABOVE CONSTITUTE APC'S SOLE LIABILITY AND PURCHASER'S EXCLUSIVE REMEDY FOR ANY BREACH OF SUCH WARRANTIES. APC WARRANTIES EXTEND ONLY TO PURCHASER AND ARE NOT EXTENDED TO ANY THIRD PARTIES.

IN NO EVENT SHALL APC, ITS OFFICERS, DIRECTORS, AFFILIATES OR EMPLOYEES BE LIABLE FOR ANY FORM OF INDIRECT, SPECIAL, CONSEQUENTIAL OR PUNITIVE DAMAGES, ARISING OUT OF THE USE, SERVICE OR INSTALLATION, OF THE PRODUCTS, WHETHER SUCH DAMAGES ARISE IN CONTRACT OR TORT, IRRESPECTIVE OF FAULT, NEGLIGENCE OR STRICT LIABILITY OR WHETHER APC HAS BEEN ADVISED IN ADVANCE OF THE POSSIBILITY OF SUCH DAMAGES. SPECIFICALLY, APC IS NOT LIABLE FOR ANY COSTS, SUCH AS LOST PROFITS OR REVENUE, LOSS OF EQUIPMENT, LOSS OF USE OF EQUIPMENT, LOSS OF SOFTWARE, LOSS OF DATA, COSTS OF SUBSTITUENTS, CLAIMS BY THIRD PARTIES, OR OTHERWISE.

NO SALESMAN, EMPLOYEE OR AGENT OF APC IS AUTHORIZED TO ADD TO OR VARY THE TERMS OF THIS WARRANTY. WARRANTY TERMS MAY BE MODIFIED, IF AT ALL, ONLY IN WRITING SIGNED BY AN APC OFFICER AND LEGAL DEPARTMENT.

Warranty claims

Customers with warranty claims issues may access the APC customer support network through the Support page of the APC Web site, **www.apc.com/support**. Select your country from the country selection pull-down menu at the top of the Web page. Select the Support tab to obtain contact information for customer support in your region.

Guide Specifications

Guide Specifications for InRow Direct Expansion

THIS GUIDE SPECIFICATION IS WRITTEN IN ACCORDANCE WITH THE CONSTRUCTION SPECIFICATIONS INSTITUTE (CSI) MASTERFORMAT. THIS SECTION MUST BE CAREFULLY REVIEWED AND EDITED BY THE ARCHITECT OR THE ENGINEER TO MEET THE REQUIREMENTS OF THE PROJECT. COORDINATE THIS SECTION WITH OTHER SPECIFICATION SECTIONS IN THE PROJECT MANUAL AND WITH THE DRAWINGS. WHERE REFERENCE IS MADE THROUGHOUT THIS SECTION TO "PROVIDE", "INSTALL", "SUBMIT", ETC., IT SHALL MEAN THAT THE CONTRACTOR, SUBCONTRACTOR, OR CONTRACTOR OF LOWER TIER SHALL "PROVIDE", "INSTALL", SUBMIT", ETC., UNLESS OTHERWISE INDICATED.
THIS SECTION IS WRITTEN TO INCLUDE THE 2004 MASTERFORMAT AND THE 1995 MASTERFORMAT VERSIONS. WHERE APPLICABLE, THESE ITEMS ARE BRACKETED AND, IN EACH CASE, UNLESS OTHERWISE INDICATED, THE FIRST CHOICE APPLIES TO THE 2004 MASTERFORMAT AND THE SECOND CHOICE APPLIES TO THE 1995 MASTERFORMAT.

PART 1 — GENERAL

1.1 SUMMARY

A. The environmental control system shall be designed specifically for precision temperature and humidity control applications. It will automatically monitor and control heating, cooling, humidifying, dehumidifying, and filtering functions for the conditioned space. The system shall be built to the highest quality engineering and manufacturing standards, and shall be floor mounted and configured for horizontal airflow, with draw-through air pattern, to provide uniform air distribution over the entire face of the coil.

1.2 DESIGN REQUIREMENTS

A. The system shall be as described in the following specification as manufactured by APC.

1. Model: _____.
2. Total net cooling capacity: _____ MBH (kW).
3. Sensible net cooling capacity: _____ MBH (kW).
4. Return air dry bulb temperature: _____ ºF (ºC) DB.
5. Return air wet bulb temperature: _____ ºF (ºC) WB.
6. Humidity: _____% RH.
7. Air Volume: _____ CFM (l/s).
8. Humidifier capacity: _____ lbs/hr (kg/hr).
9. Reheat capacity: _____ kW (BTU/hr).
10. Electrical supply: _____ V, _____ Hz.

1.3 SUBMITTALS

A. Submittals shall be provided with the proposal and shall include: capacity data, electrical data, physical data, electrical connection drawing, and piping connection drawing.

1.4 QUALITY ASSURANCE

A. The system shall be completely factory-tested prior to shipment. Testing shall include, but not be limited to: complete pressure and leak testing to ensure system integrity, “Hi-Pot” test, and controls calibration and settings. Each system shall ship with a completed test report to verify completion of factory testing procedure. The system shall be NTRL listed, MCA, and electrical system shall be UL Listed to UL 1995 and CSA 22.2 No. 236.

PART 2 — PRODUCT

2.1 STANDARD COMPONENTS

A. CABINET CONSTRUCTION

1. Exterior panels shall be 18 gauge steel with 5 lb/ft3 (80 kg/m3) density foam insulation. Insulation complies with UL94-5VA ASTM E84 flame spread and smoke developed rating of 25/50. Front and rear exterior panels shall be 18 gauge perforated steel with 69.5% open free area, and equipped with a keyed lock to provide a means of securing access to the internal components of the unit.
2. The frame shall be constructed of 16 gauge formed steel welded for maximum strength. All units shall provide maintenance from the front and rear, allowing units to be placed within a row of racks.
3. All exterior panels and frame shall be powder coated for durability and attractive finish. Exterior frame and panel color shall have color values: L = 74.50, a = –.53, b = +8.20.
4. Units shall include casters and leveling feet to allow ease of installation in the row and provide a means to level the equipment with adjacent IT racks.

B. FANS

1. Variable speed direct drive mixed flow DC fan assembly (ACRD100 and ACRD200 series):
   a. The unit shall be configured for draw-through air pattern to provide uniform air flow over the entire face of the coil. Each unit shall include six 200 mm mixed flow direct drive DC axial fans. Each fan assembly should be designed to provide 180.1 l/s (381.7 CFM) for total unit airflow of 1080.76 l/s (2290 CFM). The ACRD500/ACRP100 series includes two fans. Each fan provides 1085.5 l/s (2300 CFM) for a total unit airflow of 2171 l/s (4600 CFM).
   b. Variable speed fans: Fans shall be variable speed capable of modulating from 30-100%. Fans shall soft start to minimize in-rush current.
   c. Fan protection: Each fan assembly shall consist of a plastic injection molded bezel with integral fan discharge finger guard. Inlet of the fan should include a cage type finger guard.
   d. Operation and service: The unit should be capable of operation in the event of a fan failure. Fans shall be replaceable while the unit is in operation.
2. Variable speed fan assembly (ACRD500/ACRP100 series):
   a. Variable speed fans: The unit is equipped with two variable speed, electronically commutated, 400-mm backward incline fans complete with inlet volute.
   b. Fan protection: discharge finger guard. Outlet of the fan should include a cage type finger guard.
   c. Operation and service: The unit should be capable of operation in the event of a fan failure.

C. MAIN DISCONNECT SWITCH (ACRD500/ACRP100 series)

1. Unit shall be provided with Thermal-Magnetic circuit breakers with interrupt capacity ratings per UL489/CSA C22.2/IEC-947.
   a. Voltage: 200–240V 50/60Hz /kAIC 50
   b. Voltage: 380–415V 50Hz /kAIC 36
   c. Voltage: 460–480V 60Hz /kAIC 22
2. Air-cooled: Units shall include a main disconnect switch located on the E-panel in order to disconnect power input (600 mm models only).
3. A condenser disconnect shall be field supplied.

D. MICROPROCESSOR CONTROLLER

1. Monitoring and Configuration: The master display shall allow monitoring and configuration of the air conditioning unit through a menu-based control. Functions include status reporting, set-up, and temperature set points. Four LEDs report the operational status of the connected air conditioning unit.
2. Controls: The microprocessor controller shall come equipped with control keys to allow the user to navigate between menus, select items, and input alpha numeric information.
3. Alarms: The microprocessor controller shall activate a visible and audible alarm in the occurrence of the following events:
   a. All series:
      1. Cool Fail
      2. Air filter clogged
      3. Return air sensor fault
      4. Supply air sensor fault
      5. Rack temperature sensor fault
      6. High discharge pressure
      7. Low suction pressure
      8. Fan fault
      9. Water detected (if optional leak detector used)
      10. Check condensate management system
      11. Air filter run hours violation
      12. Group communication fault
      13. Supply air high temperature violation
      14. Return air high temperature violation
      15. Filter DP sensor failure
      16. Suction pressure sensor failure
      17. Discharge pressure sensor failure
      18. Persistent high discharge pressure fault
      19. Rack inlet temperature high violation
      20. External communication fault
      21. Internal communication fault
      22. On standby input contact fault
      23. A-link isolation relay fault

b. ACRD100 series and ACRD200 series only:
    1. Condensate pan full
    2. Upper fan power supply fault
    3. Lower fan power supply fault
    4. Suction temperature sensor failure
    5. Persistent low suction pressure fault
    6. Factory configuration not completed
    7. Liquid refrigerant sensor failure
c. ACRD200 series only:
    1. Condenser fluid valve actuator fault
    2. Outdoor heat exchanger (OHE) fault
d. ACRD500/ACRP100 series only:
    1. Compressor drive communication fault
    2. Compressor drive fault
    3. Compressor drive warning
    4. Compressor run hours violation
    5. Condensate pump run hours violation
    6. Fan run hours violation
    7. Invalid supply setpoint
    8. Idle mode active
    9. High pressure switch active
    10. Compressor high pressure
    11. Supply humidity sensor fault
    12. High suction pressure
    13. Excessive compressor cycling
e. ACRP100 series only:
    1. Humidifier water conductivity high violation
    2. Humidifier fault tolerance exceeded
    3. Humidifier low water
    4. Humidifier excessive output reduction
    5. Humidifier drain fault
    6. Humidifier cylinder full
    7. Humidifier replace cylinder
    8. Humidifier RS485 communication fault
    9. Humidifier run hours violation
    10. Humidity high/low violation
    11. Return humidity sensor fault
    12. Heater fault
    13. Heater run hours exceeded
    14. Heater interlock shutdown

4. Logging: The microprocessor controller shall log and display all available events. Each alarm log shall contain time/date stamp as well as operating conditions at the time of occurrence. Controller shall display the run time hours for major components.

E. NETWORK MANAGEMENT CARD

1. The unit shall include a network management card to provide management through a computer network through TCP/IP. Management through the network should include the ability to change set points as well as view and clear alarms.

F. COOLING COIL AND CONDENSATE PAN

1. ACRD100 and ACRD200 series Direct Expansion: The cooling coil shall use corrugated aluminum fin and copper tube coils. The coil header is equipped with a drip plate in the bottom to capture and direct the condensation accumulating on the suction header tube to the drain pan.
2. ACRD500/ACRP100 Direct Expansion: Cooling coil shall use raised lance type corrugated aluminum fin and 1/2 inch OD (12.7 mm) copper tube coils. Fin shall be a minimum of 0.0055 inch thick. Tube wall shall be a minimum of 0.016 inch thick wall. Coil end supports shall be a minimum 18 gauge G90 galvanized steel. Coil shall be rated for a maximum pressure of 500 psig (3447.3 kPa), and the coils are certified in accordance with UL207. Coil header is equipped with a drip plate in the bottom to capture and direct the condensation accumulating on the suction header tube to the drain pan. Coil has 6 circuits complete with brass distributor and copper distribution tubes.

G. COMPRESSORS (ACRD500/ACRP100 series only)

1. Variable Speed Compressor/VFD Assembly (ACRD500/ACRP100 series)
   a. Compressor: The unit shall be configured with a variable speed reciprocating hermetic compressor using a matched VFD. As a result, the compressor speed can be varied through a range between 30 and 85 Hz to accommodate varying load conditions. VFD firmware is written to include oil return protection in cases where pipe velocities may drop to low speeds during low loading periods.
   b. Compressor is electrically protected through the VFD.
   c. Compressor utilizes a noise cap for noise reduction.
   d. Sight glass provided for air cooled system oil charging.
2. Scroll Compressor (ACRD100 series and ACRD200 series only)
   a. The high EER and few moving parts of scroll compressors shall provide efficient and reliable operation. Scroll technology has unparalleled ability to withstand liquid refrigerant “slugging,” which is a major cause of compressor failure.

H. CONDENSATE PUMP

1. ACRD100 series and ACRD200 series: factory installed and wired condensate pumps shall pump at 34 l/h (9 g/hr) at 4.9 m (16 ft) of head. Each pump shall have dual internal floats.
2. ACRD500 series: A single factory installed and wired condensate pump shall pump at 32 l/h (8.45 g/hr) at 3.5 m (11.5 ft) of head. The pump shall have dual internal floats.

I. CONDENSATE RESERVOIR

1. Each pump shall have a condensate reservoir made of polymeric materials to prevent corrosion.

J. FILTERS

1. ACRD100 series and ACRD200 series:
   a. The standard filters shall be 20% efficient per ASHRAE 52.1, MERV 1 per ASHRAE 52.2, 1/2 in washable mesh filter.
   b. The optional filter shall be high capacity 2 in pleated, UL 900 Class 2, moisture resistant, with average atmospheric dust spot efficiency of 30%, per AHRAE Standard 52.1, MERV 8 per ASHRAE 52.2.
2. ACRD500/ACRP100
   a. The standard filters shall be 30% efficient per ASHRAE Standard 52.1, UL Class 2 (MERV 8 per ASHRAE 52.2). Filters shall be EN779 G4 efficient.The 3.75 in (96 mm) deep, pleated filters shall be replaceable from the rear of the unit.
   b. The optional filter shall be 85% efficient per ASHRAE Standard 52.1 (MERV 13 per ASHRAE 52.2, EN779 F7).

K. HUMIDIFIER (ACRP100 only)

1. Humidifier shall be able to modulate capacity. The humidifier shall be self-contained, steam-generating type, factory piped and wired, with disposable cylinder and automatic solid-state control circuit. Humidifier canisters shall be replaceable. The humidifier controller shall communicate directly to the microprocessor controller and provide complete status and control at the operator interface. Humidifier shall control flush cycling and conductivity via automated controls. Humidifier shall be capable of producing up to 6.6 lbs (3 kg) of steam per hour.

L. ELECTRIC REHEAT (ACRP100 only)

1. Reheat elements shall be low watt density, wired for three-phase, loaded equally on all three phases and shall be electrically and thermally protected by both automatic and manual reset cutouts. Reheat capacity shall be 6 kW.
2. Reheat coils shall be stainless steel, fin tubular construction. Heater casing shall be 20 gauge G90 galvanized steel.
3. Heater shall be provided with self-engaging electrical connectors upon installation. Heater with manually connected conductors are not acceptable.

M. TEMPERATURE AND HUMIDITY SENSORS

1. Internal Temperature Sensors: Thermistor temperature sensors shall be mounted behind the front and rear doors to provide control inputs based on supply and return air temperature. Sensor accuracy shall be within +/– 1 degree F accuracy.
2. Remote Temperature Sensors: Three remote rack inlet temperature sensors shall be shipped with the unit to provide control input based on rack inlet temperature.
3. Remote Temperature Sensors
   a. ACRD500/ACRP100 series: Three remote rack inlet temperature sensors shall be shipped with the unit to provide control input based on rack inlet temperature.
   b. ACRD100 and ACRD200 series: One remote rack inlet temperature sensor shall be shipped with the unit to provide control input based on rack inlet temperature.

4. Internal Humidity Sensors: Humidity sensors shall be mounted behind both the front and rear doors and shall provide control input based on humidity in supply air. Humidifier sensor shall be +/– 3% RH accuracy full scale. (ACRD500/ACRP100 series only)

N. COOLING FLUIDS (ACRD200 Series)

1. Water and solutions of propylene or ethylene glycol up to 50% may be used. Solutions of brine or other aqueous salt are NOT permitted.

O. FREEZE PROTECTION (ACRD200 Series)

1. Per ASHRAE Handbook Fundamentals 2001 21.5, a maximum of 30% ethylene glycol and 35% propylene glycol are needed for freeze protection. See the ASHRAE handbook for more details.

P. CABLE WATER DETECTOR (OPTIONAL)

1. A leak detection sensing cable shall be shipped loose with the unit. If water or other conductive liquids contact the cable anywhere along its length, the main controller visually and audibly annunciates the leak.
2. The detector shall be provided with a 20 ft (6.1 m) of cable. Cable may be cascaded up to 80 ft (24.4 m).

Q. BRIDGE POWER CABLE TROUGH

1. An overhead power distribution bridge, that sits between adjacent NetShelter racks and allows for removal of the unit without disrupting the overhead power cabling, is available as an accessory.
2. Cable trough shall be constructed of 16 gauge cold rolled steel with a black powder finish.

R. BRIDGE DATA PARTITION

1. An overhead cable distribution, that sits between adjacent NetShelter racks and allows for removal of the unit without disrupting overhead cabling, is available as an accessory.
2. Data partition shall be constructed of 16 gauge cold rolled steel with a black powder finish.

Worldwide Customer Support

Customer support is available at no charge via e-mail or telephone. Contact information is available at **www.apc.com/support/contact**.

© APC by Schneider Electric. APC and the APC logo are owned by Schneider Electric Industries S.A.S., American Power Conversion Corporation, or their affiliated companies. All other trademarks are property of their respective owners.